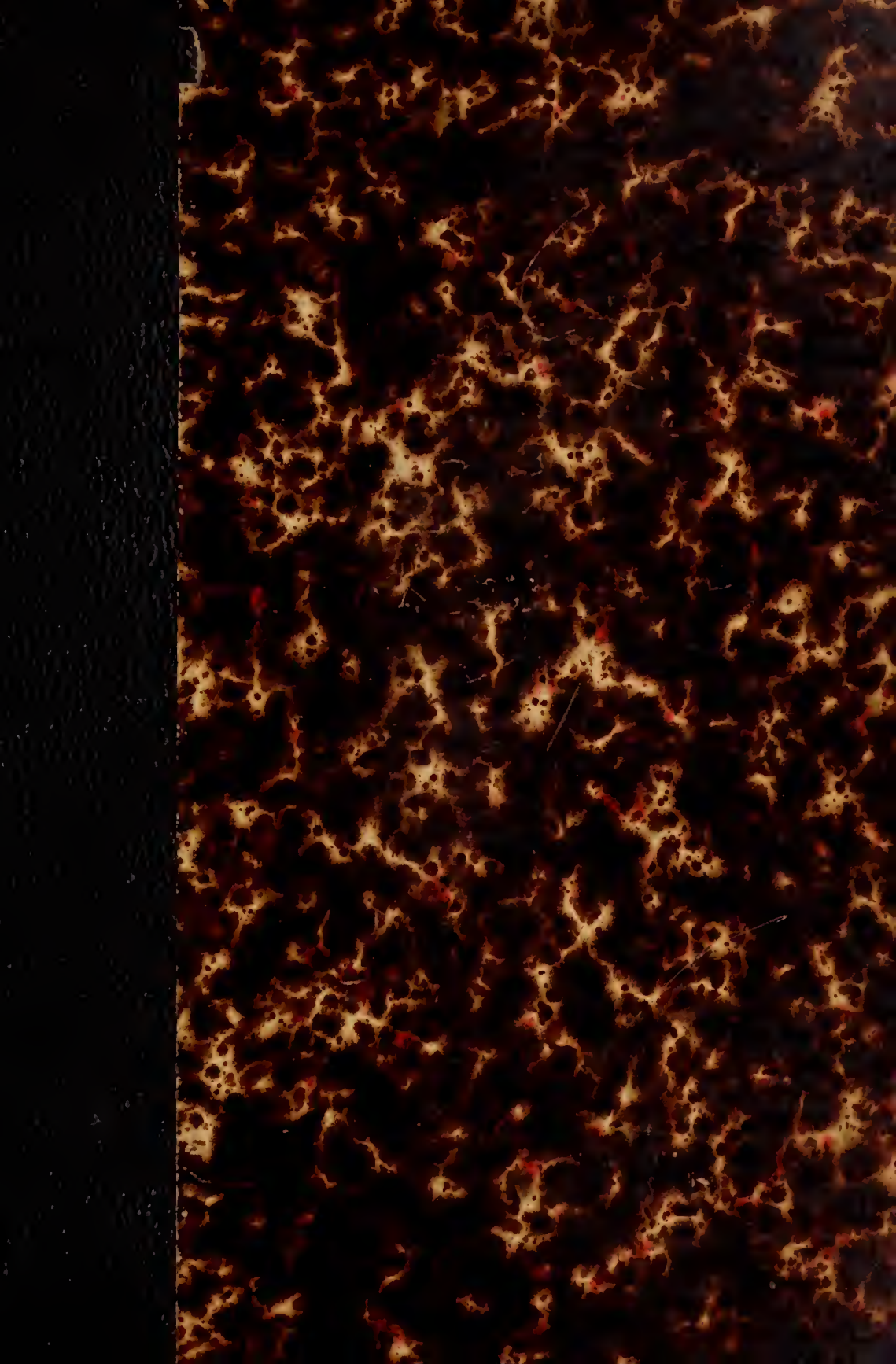
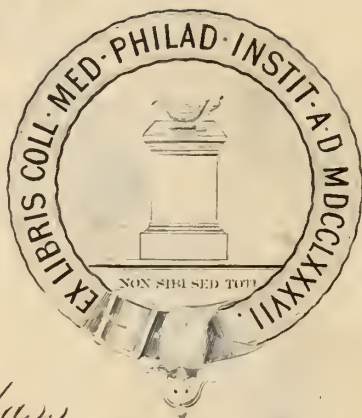




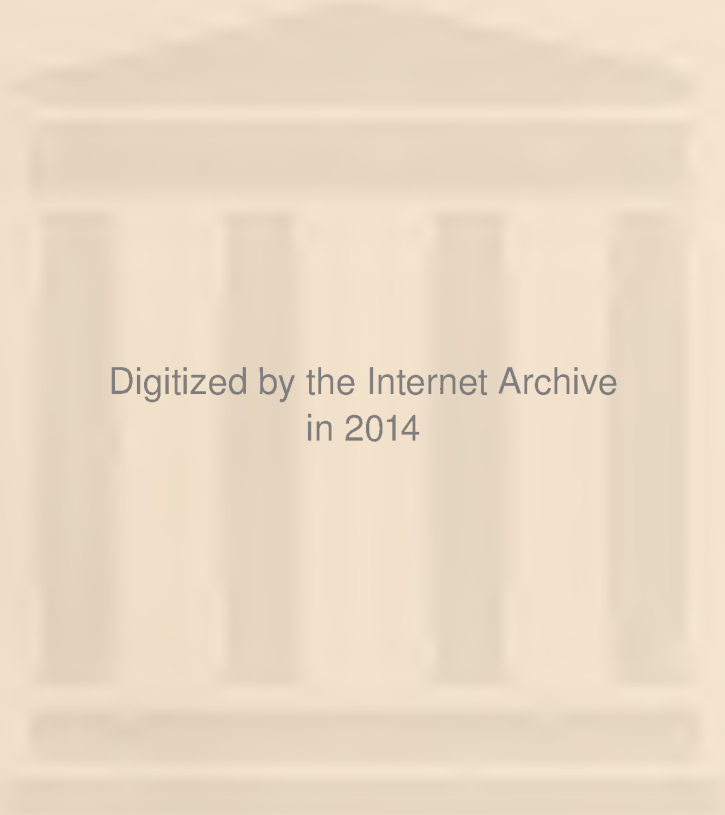
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THE ANNALS OF HYGIENE

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OF
THE STATE BOARD OF HEALTH OF PENNSYLVANIA,
AND OF OTHER STATE BOARDS OF HEALTH AS FURNISHED.

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JOSEPH F. EDWARDS, A.M., M.D.

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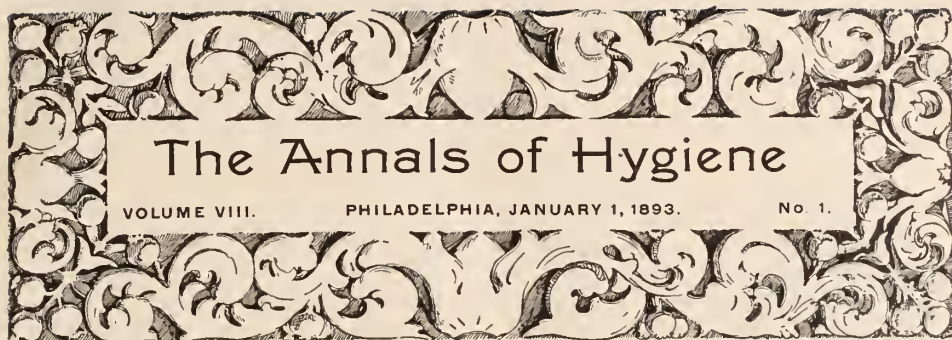
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The Annals of Hygiene

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No. 1.

COMMUNICATIONS

Microbes—The Smallest Enemy of Mankind.*

BY W. M. L. COPLIN, M.D.,
Of Philadelphia, Pa.



THESE little things which we are about to study are extremely small and belong to the vegetable kingdom. Many are of the impression that they are animal parasites, and this impression has been deepened by referring to them as "bugs." They are not bugs, but little vegetable growths. Some of them we are more or less familiar with; for instance, the yeast, which is added to bread to make it rise, is a member of this group. There are several tribes of microbes. These tribes may be likened to the different races of man, in one sense of the word; in another to the different varieties of plants. We have one form which is round like a billiard-ball or a base-ball; we have another form which is rod-shaped, like a lead pencil, and another which is shaped like a corkscrew or spiral-shaped, and still another division has a form which is ovoidal, shaped like an elongated egg, instead of having square ends like the pencil or rod-shaped organism; it is rounded at the ends and but very little longer than thick. One of the interesting features about these microbes is their extreme minuteness, and another the rapidity with which they grow. Their minute size is such as to be realized by but very few, and we have to look at them with a very high magnifying power of a microscope; for example, some of them are 1-35000 of an inch in diameter, some are even smaller, many much larger. But take that size as a fair average, we can form some idea of their extreme

* A lecture delivered in the "Popular Course" series before the Y. M. C. A. Illustrations drawn by Dr. Bevan; from advance sheets of "Hygiene and Public Health" by Coplin and Bevan.

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minuteness by comparing them in size to other objects. For instance, if we take the head of an ordinary pin, a hundred thousand of these organisms could be safely lodged upon its surface, and an ordinary hyphen, used in printing, would cover enough space to afford a hiding place for an equal number. Within the letter "O" a family of several millions could safely be concealed; as many bacteria as are represented by the entire habitation of the globe could be placed in a lady's thimble. On the other hand, if we compare the magnification necessary to study these organisms and could apply it to man, we would reach some of the following conclusions: If, for instance, I magnify one of these minute organisms until it reaches one-half of an inch in diameter, and if I then magnify a human being, say of my height the same amount, I would be twenty-five miles in height. You thus see how extremely minute are the objects which we are studying, and magnified to a size which you will observe upon the screen, an ordinary period, used in punctuation, would be hundreds of feet in diameter. The methods by which we study these minute organisms are simply those used by any floraculturist in studying plants. Let us suppose, for instance, that the Arctic explorers, who have just returned, brought with them some rare specimens of plant life which it was desirable to study. They would proceed about as follows: An artificial garden would be made, as nearly as possible representing the material upon which they grow, at the same time an artificial atmosphere would be secured as closely as possible representing the atmosphere in which the plant naturally grew.

For bacteria we proceed about as follows: We make a culture medium, as we call it, really a garden, and on this we plant the organism and watch the development. From this growth we mount slides for the microscope and there proceed to study its development. Some of these gardens I will pass around among you; (remember these germs are all harmless and will not give rise to any trouble whatever). The material upon which they grow is an artificial garden best suited for their nutrition. Some of these microbes have extremely interesting histories; for example, the one here with the very long name has been handed down to us by the superstition of ages. It grows readily upon bread, especially upon uncooked bread or dough, so that when, in olden times, bread was mixed and set out in the sun, or in a warm place, not infrequently these germs, carried there by the atmosphere, would find a lodgment upon the dough and these grow extremely rapidly. Its bright red color gave it the appearance of being blood, and people were supposed to be under some special Divine curse and that blood grew on their bread as the result of their misdeeds. The condition developed into what was known as the "Bleeding Host" and kept the superstitious in continual horror. Another form of germ, with which you are all more or less familiar, is the yeast plant. I shall show you this later with the lantern. A still more common organism is that green mould found on old clothes, old boots and shoes. This mould has a very long Latin name and there are several varieties of it, some more common near the seashore, others in damp cellars, others in attics. This mould is a microbe in one sense of the

word, although not belonging to that variety which commonly produces disease. You all have heard of ringworm and barber's itch; these are due to a vegetable parasite or a microbe. (See Figs. 1, 2, and 3).

We will now proceed to study some of these organisms from the lantern and see some of their peculiar characteristics, as they appear highly magnified. Some of these pictures, indeed all of them, are not artistic, but they are accurate, most of them taken from photographs, some of them drawings made by Dr. Bevan from actual slides. The first that we will look at is among the first that were discovered. It was studied by that savant, Pasteur, under the following conditions: It was found that the silk-worms were suffering from some disease which prevented them from developing good cocoons, hence as this was one of the principal industries in certain parts of France, great interest was aroused at the falling off of production and also

at the destruction of the worm. M. Pasteur found upon the bodies of these worms a small vegetable parasite or microbe, which he named the *micrococcus bombysis*. He then proceeded to discuss some method for the destruction of the parasite without killing the worm; this he succeeded in doing, and first brought to the attention of the world that new science of bacteriology which has revolutionized surgery and resurrected preventive medicine from the myths and amulets and charms of the dark ages.

Here we have the next form of organism, the *micrococcus* of which I show you models. (See Figs. 1, 4 and 5). Here they grow in several forms and have names signifying their peculiar characteristics; for instance, we have a variety which we call the streptococcus or chain coccus, so named from its resemblance to a string of beads as worn around a lady's neck. Then we have the staphylococcus or grape-like coccus, so named because it grows in clusters like bunches of grapes. Then we have the monococcus, or the one that always grows alone, does not form in chains or clusters. Then we have another variety named by the number that grow together; for instance, the diplococcus, where two are growing together (see Fig. 6); and the tetracoccus, where four are growing together. Some of these are pathogenic or disease producing, others are not. The one of pneumonia belongs to the group of diplococci, or double cocci; and the microbe which causes erysipelas belongs to the streptococcus group.

The next in order are the bacilli or rod-shaped organisms, and in this class belong many of the disease producing microbes. The first that was described

FIG. 1.



ACTINOMYCES.
Beck's homo. im. 1-12 Cle. 2.

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of these was that of anthrax or malignant pustule or splenic fever, a disease which killed large numbers of stock and which was occasionally communicated to man; it was usually in the form known as "wool sorter's disease," because in sorting wool from sheep dead of the disease, it was conveyed to man. (See Fig. 7). It was for the same reason known as "hide sorter's disease." In the former instance, it usually occurred in the lungs, in the latter, on the hands. It was extremely fatal and but few recovered. This bacillus, which is found present in all cases of the disease, is one of the largest and best known of microbes.

Another disease producing bacillus is that of consumption. (See Fig. 8). Consumption, you know, carries off more human beings than all other diseases

FIG. 2.



THRUSH FUNGUS.
Beck's homo. im. 1-12 Cle. 2.

combined, exclusive of epidemics. It is a most dreadful disease, and still, at the same time, but few of the laity realize the dangers of its spread. It is due to the bacillus of tuberculosis, as it is called, and I show you here a slide made from the sputum of a patient suffering from consumption. You will see these rod-shaped organisms as abundantly present, and were you or I susceptible to tuberculosis or consumption, we could easily get the disease by either inhaling or swallowing a few of these germs. But you must remember that we have, at least the majority of us, an absolute protection. Let us illustrate: In order to grow wheat we have to have a good soil. If you take wheat and plant it in some soils, it would not grow. The same is true of bacteria. There are none of us here who are not daily receiving some of these infectious materials, still few of us suffer

from the result; in other words, our soil is such as to combat it or prevent the development of the microbe; later on, it is possible for us to contract the disease. I may have resisted the infection of consumption for years, but let me get a heavy cold or let me have pneumonia, which weakens me, something which destroys the protection of health, and immediately the organism gains a foothold, and once it has secured an entrance, the disease progresses with its usual rapidity.

Now, there are other bacilli or rod-shaped organisms belonging to this class; for example, we have that of septicemia or blood poisoning in fowls or chickens, and it is known as chicken-cholera, although there are none of the symptoms of ordinary cholera. (I show you here some of the blood containing the organism of chicken-cholera.)

FIG. 3.



FAVUS. HOMO. IM. 1-12 OC. 12 BECK'S.

(a) Germinating tube cultivated on gelatin. (b) Conidia of *Oidenn lactis*. (c) Formation of fruit. (d) Mycelial threads with fructification.

Then we have a bacillus which is described as the organism which causes pneumonia, at the same time we have the diplococcus, which is supposed to have some action in that direction. When milk sours, it is due to a bacillus. Typhoid fever is due to a bacillus, of which I show you a slide. (See Fig. 9). This bacillus gets in pure water. Malaria was at one time supposed to be due to a bacillus, but the evidence is at present to the contrary. The most malignant of all diseases in childhood, namely, diphtheria and membranous croup, are due to a bacillus. (See Fig. 10). Of these I show you slides.

A disease which has caused a great many deaths among horses and occasionally among men, namely, glanders, is due to a bacillus. (See Fig. 11).

There are many other forms of extremely interesting bacilli, but we shall

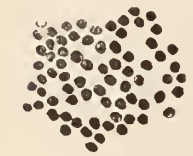
not stop to discuss them. The bacilli of leprosy and of tetanus belong to this group. (See Figs. 12 and 13).

We next come to discuss the very interesting series of organisms, known as the spirilli. These are spiral-shaped like a corkscrew and grow uniformly in that shape. Some of these are very prettily colored, as is the spirillum rubrum or red spirillum, which has a beautiful bright scarlet hue. The one spirillum which has attracted more attention than all others is the spirillum of cholera; this is called a bacillus. Suppose we take a corkscrew and cut it up into small fragments about one-half of an inch long, each one would be shaped like a comma, and hence the name which is given to the spirillum, namely, comma bacillus, cannot be considered appropriate, although it is descriptive of its shape. Comma bacillus is about the size of the bacillus which causes consumption; it is a little smaller in length and a little narrower. It is usually found in water, from which it gains ingress to the system and sets up that dreadful disease—Asiatic cholera. The cholera bacillus was discovered by Robert Koch when appointed on the Cholera Commission from Germany. Relapsing fever is due to a spirillum. (See Fig. 14).

We next come to the consideration of how these germs produce disease. In the first place they act locally very much in the same manner that we have the parasite in certain skin diseases acting. These local manifestations lead to the development of an inflammation or irritation at the seat of the infective process. Aside from this local action these bacteria produce chemical products, and these chemical products act locally as well as systematically; let us illustrate: We have the micro-organisms or microbes which produce alcohol. Now if that micro-organism be inoculated on certain tissues, it leads to certain changes that are only temporary and not very well marked. Suppose that we let it act in a saccharine fluid sufficiently long, it rapidly produces alcohol, and with the production of alcohol we have this exhibition of the development of a poison from the action of the germ, which is itself not of necessity poisonous. Now the alcohol as you all know will produce certain well defined effects, and these effects will be manifested upon certain parts of the system, notably, upon the nervous system; while the systemic development may be well marked, there will be also a constant local change, the alcohol will set up a catarrh of the stomach, so that we here have a drug which is practically a product of microbes, but which acts locally in producing catarrh on the stomach and systematically in producing alterations of the nervous system and structural change in certain glands and organs.

We now come to consider the methods which we have of opposing these organisms. Considering, as we have, briefly the comparatively small numbers of these small bodies, and when we understand their extreme virulence and the

FIG. 4.



STAPHYLOCOCCUS OF SUPPURATION.
Beck's homo. im. 1-12 Cle. 2x2. Stain Aniline Gentian Violet.

FIG. 5.



STREPTOCOCCUS PYOGENES.
Beck's homo. im. 1-12 Oc. 2x2.

likelihood of infection proving fatal, the great wonder is, How do we live? How is it that we are not constantly succumbing to the influence of these small pests? In the first place there is within our organism an ability to resist the invasion of a vast number of germs. This power is an immunity and has been ascribed to several things. In the first place it has been shown that the blood serum or liquid portion of the blood is, when we are in a condition of perfect

FIG. 6.



FRIEDLANDER'S PNEUMOCOCCUS.
Beck's homo. im. 1-12 Oc. 2x2.

FIG. 7.



BACILLUS ANTHRACIS.
Beck's homo. im. Oc. 2x2.

health, antagonistic, indeed destructive, to the organisms of disease. How important this is; were it not the case the inhalation of a single tubercle bacillus would lead to consumption, and in our fight with pneumonia, erysipelas, lock-jaw, anthrax and like diseases we would fall before the overpowering enemy, and the earth would be swept as clear of habitation and of man as when first the trowelled surface of the seething mass was hardened for our repetition. This wonderful ability of the cells, which composes our organisms, to eat up

FIG. 8.



BACILLUS TUBERCULOSIS.
Beck's homo. im. 1-12 Oc. 2.

FIG. 9.



BACILLUS TYPHOSIS.
Beck's homo. im.
Cle. 2x2.

FIG. 10.



LOEFFLER BACILLUS
OF DIPHTHERIA.
Beck's homo. im.
Oc. 2.

FIG. 11.

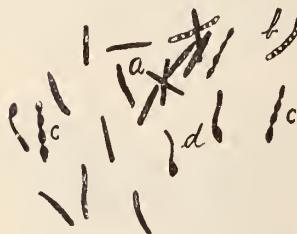


BACILLUS MALLER
(GLANDERS).
Beck's homo. im.
1-12 Oc. 2x2.

and destroy bacteria, is well illustrated in the case of anthrax, and I here show you some pictures illustrating some of the methods by which the bacillus disappears. We have here a picture of a white blood cell which you see is creeping around and devouring the organisms which are threatening to invade its home. After awhile the organisms will be entirely encompassed within the cell, and at this point digestion and dissimilation of the bacillus will take place and thereby its destruction. In the case of cholera bacillus we know that a normal state of the stomach will resist its invasion, and that an acid condition

will render it impossible that the individual be affected. Now all this has a moral. It proves that in order to overcome disease, to prevent its invasion, to

FIG. 12.



BACILLUS LEPTA.

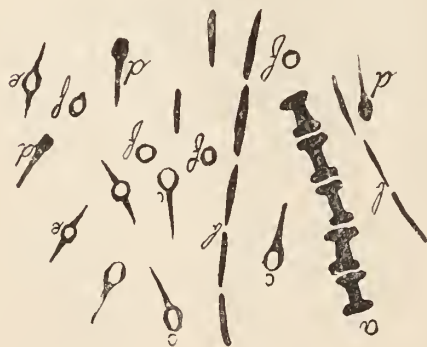
Beck's homo, im. 1-12 Oc. 2X2.

(a) Mature bacillus. (b) Bacillus sporing. (c) Beaded bacillus. (d) Club shaped bacillus.

limit its abilities, the human organism must be kept in a certain standard unit of health. In this battle for life the army of the citadel must not be weakened by debauchery. Nature, therefore, places in our hands abilities to overcome and encompass the dangers which surround us, and but commands that we shall cherish and foster and develop all of these as part of the armament with which we are to meet and conquer the common enemy.

Now from without our methods of resisting bacteria amount practically to some form of destroying these pests, and this we consider as disinfection. The agents used for the destruction of germs are known as disinfectants. These are to be contrasted with agents used for rendering the growth less probable; these are known as antiseptics, while deodorants may or may not be disinfectants. Thus an atmosphere could be saturated with cologne water to such a

FIG. 13.



BACILLUS TETANI.

Beck's homo im. 1-12. Oc. 2X2. (a) Thread of spool like bacilli. (b) Thread of spindle shaped bacilli. (c) Club shaped bacillus spore in large end. (d) Club shaped bacilli. (e) Spore forming in centre of bacillus. (f) Free spores.

FIG. 14.



SPIRILLIUM OF RELAPSING FEVER.

Beck's homo, im. 1-12 Oc. 2X2.

degree that malodors could not be discernible, and still that atmosphere

The agents used for the destruction of germs are divided into thermal and chemical. Mechanical means are not applicable. The old Yankee trick of mailing upon the receipt of one dollar an absolutely sure and certain method for the destruction of potato bugs, could not be applied in the case of bacteria. You know the old trick was to advertise a certain method of killing them, and then when the dupes bought the advertised method it would turn out to be two blocks; upon one was printed: "Put the potato bug on this block and press with the other one." In other words, it

was a mechanical method of securing their destruction. This is not possible with bacteria, they grow upon a hone and are so extremely small that no amount of grinding or trituration will lead to their destruction. So that we resort to two methods for securing the destruction of micro-organisms the application of heat and the application of chemicals. Cold has no influence on them; they may be reduced to 40° , 50° or 60° below the F., freezing point, and still when a suitable temperature is reached they grow. Not so with heat, when we reach a temperature of 212° F., that is the boiling point, all germs die, provided the exposure is sufficiently long; in some death takes place immediately, that the temperature is raised and that raising but little. In others it must be prolonged. Thus it has been shown that the organisms of anthrax will stand the boiling temperature for from two or three hours, and the organisms of consumption is but slightly less resistant. That heat is generally used and is acceded to be the best disinfectant which we possess, you gentlemen may be aware, at least any of you who have had occasion to pass the quarantine borders within the so-called cholera scare, the heat is applied for the disinfection of the baggage by placing the baggage in large chambers suitably constructed for maintaining the heat and preventing the escape of the steam. Here all organisms are rapidly killed. This is undoubtedly the most efficient and most reliable method for the destruction of bacteria. Besides we have in the thermometer a ready means for measuring the intensity of the methods used. Dry heat is not nearly so good as moist heat and heat under pressure, from ten to twenty-five pounds, is three times as efficient as heat at ordinary pressure.

Now we pass on to the consideration of chemical disinfectants, agents which may be used for the destruction of bacteria. Of these a large number have been proposed, none of which, however, have proven entirely satisfactory. The ideal disinfectant would be one which would always destroy micro-organisms but which would never be fatal to the human being; such a disinfectant has not yet been found. All antiseptics that are efficient are at the same time poisonous. Thus corrosive sublimate is a most virulent metallic poison, carbolic acid is poisonous, as are chloride of lime and sulphate of iron.

For disinfection in our homes, we shall resort to some of these disinfectants. Sulphurous acid as developed by burning sulphur in the presence of moisture, has had probably the largest general application, but whether that is as efficient as some of the other disinfectants, is at present doubtful. It must be very concentrated. Burning a little roll of sulphur as thick as your thumb, so-called sulphur candle, in a room ten by twelve or twelve by fourteen feet, is perfect nonsense. Less than two pounds of sulphur to the thousand cubic feet is useless. For disinfecting purposes where it can be applied, corrosive sublimate possesses signal advantages. It should be used in the strength of from 1 to 500 to 1 to 100 of water, preferably the latter, and where injury will not result it had best be used in a slightly acid solution. It is efficient except where there are quantities of albumin present. In the presence of albumin mercury is decomposed, therefore in the presence of animal matter, such as meats, kitchen

refuse, etc., we had best depend upon chlorine in the shape of chlorinated lime, which should be sprinkled freely over the material to be disinfected, and its action accentuated by the addition of a small quantity of acidulated water, which liberates the chlorine. Decomposing animal matter may be in this manner disinfected and at the same time deodorized. I shall here caution you and say that all faith pinned upon aromatic deodorants, such as Koch's oil—with which Koch never had anything more to do than you—nor in the Pasteur aromatic bottle and similar compounds are made to catch the public and deceive the unscientific, you should have no confidence in them. Hanging up inside of an infected area a small wick or flash or bottle or sponge or what not, saturated with the disinfectant, can have no more influence upon the disinfection of the air than simply exposing any other useless means. Remember that, the efficiency of the disinfectant bears no proportion to the smell of the disinfectant, and that as in other places throughout life, he who works calmly, quietly, steadfastly, has twice the efficiency of the trumpet heralded and widely advertised.

Disinfection is always to be carefully supervised by a competent individual, and, as a rule, members of the laity should never entrust the disinfection of materials to servants or to unskilled labor of any kind. Where it is to be presumed that any locality, room, out-building, piece of clothing or any other material is the bearer of infectious or dangerous contagion, it will be a saving of time and expense to secure a trained and efficient sanitarian to superintend the process of disinfection. For this reason, if for no other, I have refrained from giving formulæ, as I have rarely found the use of such materials efficient in untrained hands.

The Prevention of Contagion.*

BY WILLIAM M. WELCH, M.D.,

Physician to the Municipal Hospital for Contagious and Infectious Diseases, Philadelphia.



THE question of protection against contagious and infectious diseases is one of great importance to the welfare of mankind. It is a question which has received attention in all ages, but in no age have so positive and grand prophylactic results been attained as in the present, and this is owing to the fact that we have arrived at a more definite knowledge concerning the nature of the causes of this class of diseases than we formerly possessed. Through cleanliness and hygienic measures alone, many diseases which formerly devastated whole communities have now become well nigh eradicated from the globe. For instance, about the middle of the fourteenth century a disease known as the *black death* swept over Europe and Asia; in Venice three-fourths of the

* A lecture delivered before the Young Men's Christian Association of Philadelphia.

population died of that disease, and the remainder only escaped by flying to the islands; in Germany more than a million lives were sacrificed by this scourge; in Italy fully one-half of the inhabitants were lost; while in England, it is said, only one-tenth of her population was spared. A disease called the *plague* was also at one time the scourge of various countries. Not only have these diseases become quite unknown, but even typhus fever, cholera and small-pox are by no means so prevalent at the present day as formerly. It is the hope of sanitarians that, through the constantly increasing knowledge of the causes relating to infectious diseases in general, the whole of this class of diseases will be in the near future still further lessened in frequency.

The ancient physicians held very vague and curious notions in regard to the causes of the devastating epidemics of their day. They spoke of a periodic pestilential constitution of the air; of some peculiar influence exerted by the planets; of spasmodic convulsions of the sickened earth, and of many other absurd hypotheses as accounting for their presence. Among the various causes assigned, one was that there was a peculiar contagium vivum, or living contagion, for each disease; and this, I may say, was the nearest approach to the true theory, or the one now generally accepted. It was thought that during the prevalence of an epidemic small infecting animals, or animalcules—too small to be seen by the naked eye—floated about in the air, and that the disease was thus spread from one locality to another. Some carried this notion to an extravagant length and contended that these animalcules flew about in the air something like a cloud of locusts, and that they could be killed or driven away by making a great uproar, such as blowing of trumpets and firing of cannon. But, through advancement in sanitary science, we now have a more definite knowledge of the causes of epidemics, and are able to direct our efforts against contagion much more intelligently and effectively than was possible in the days of our predecessors.

Before considering the means to be made use of to protect against the spread of contagion it is necessary to know something about the nature and characteristics of the infecting agent. It has always been known that in infectious diseases there is something transmitted from the sick to the healthy. This something is now believed to be—indeed, in many cases, proved to be—small living organisms, so small as to be seen only by a powerful microscope; hence, they are called micro-organisms. They are sometimes spoken of as microbes, bacteria, disease germs, etc. In some contagious affections the disease germs are conveyed from the sick to the healthy by the air that is breathed—being given off by the breath and the exhalations from the body of the sick. In some others it is necessary for the transmission of the infection that the infecting agent shall reach the digestive tract, or the intestines; and, in still others, infection only takes place by direct contract, or by inoculation. Syphilis is a striking example of the latter class, and the way to avoid this and all similar diseases is apparent enough to all.

Prominent among the infectious diseases which owe their origin to the entrance of the infecting germ through the intestinal tract are typhoid fever

and cholera. It is true there are some who still believe that cholera is communicable from person to person by means of the lungs, but the great majority regard it as primarily an intestinal disease. But few now think of accounting for typhoid fever in any other way than that the infecting principle enters by the stomach and intestines. Germs capable of reproducing either of these diseases may always be found in the intestinal tracts of their respective victim. These germs are thrown off in great abundance with the discharges from the bowels of such patients, and from this source often find their way into drinking water. Rivers and wells are not infrequently polluted in this way, and become the source of extensive epidemics. The famous Milbank Prison, of London, was frequently the centre of severe epidemics of typhoid fever so long as the water supply was drawn from the 'Thames' River as it flowed past the prison, but after the supply was taken from an artesian well, only three cases occurred in eighteen years. This change of water supply was carried into effect in the midst of a severe epidemic of cholera, and in six days afterwards that disease suddenly ceased in the prison. Many other examples might be given, but this is sufficient to show that the infectious principle of cholera and typhoid fever may be conveyed through drinking water.

Milk, also, sometimes serves to communicate the infection of typhoid fever and cholera. The germs of these diseases may get into milk in various ways. For instance, dishonest dealers often add water to milk in order to increase its bulk, and this water may contain the disease germs. Or, polluted water may be used to cleanse the milk cans. It is only necessary that a few of these germs find their way into milk, for once there they rapidly multiply.

There are still other ways by which these micro-organisms may be taken into the stomach. Very small particles of dejecta from the bowels of fever or cholera patients may become thoroughly dried and so light as to float in the atmosphere in connection with particles of dust, and perchance fall into milk, on butter, bread or some other article of diet. Through carelessness, nurses or other attendants upon the sick may accidentally convey the disease germs to their own mouths by their fingers. It is, therefore, evident that there are various ways by which the infecting principle may reach the intestinal tract.

Now, the practical question is, how are we to guard against the infection of these diseases? As typhoid fever, and, I think I may add, cholera also, are more frequently produced by polluted drinking water than by any other agency, it is important to look after its purity. If suspected of containing the germs of either of these diseases, it should be boiled. Boiling for fifteen or twenty minutes is quite sure to kill all disease germs.* Filtering will separate gross organic material from water, but will not always separate micro-organisms.

Suspected milk should also be boiled. If suspicion rests upon articles of diet that cannot be cooked, they should be thrown away. Children and others about the house where sickness exists should never be allowed to eat anything that is brought down from the sick-room. It is in the end far more economical, even if viewed from a pecuniary standpoint alone, to cast all such articles away.

I have told you that the stools of typhoid fever and cholera patients

contain the microbes capable of propagating these diseases; it is, therefore, important that they should be disinfected immediately upon their issue from the body. This may be done by using chloride of lime, which is one of the simplest and most effective disinfectants known. It may be used by placing into the vessel for receiving the stool two tablespoonfuls of chloride of lime and a pint of water. The stool should be allowed to remain in this solution for half an hour before it is cast away. In the absence of this, or any other disinfectant, boiling hot water may be used. If pains were taken to thoroughly disinfect the stools of all typhoid fever patients, rivers and wells would no longer become polluted by the germs of this disease, and thus the disease itself might in time become extinct.

To the class of diseases from which contagion is transmitted through the medium of the atmosphere belong measles, scarlet fever, diphtheria, typhus fever, smallpox and some others. The nature of the contagion here also is doubtless a peculiar micro-organism in each disease, although this has not as yet been clearly demonstrated in all of these affections. The contagious principle is given off by the breath and the exhalations from the body of the patient, and becomes mixed with the atmosphere. It is in this way that the atmosphere becomes the medium of conveying contagion. The distance to which the contagion is carried by the air depends upon circumstances. In the open air it is not carried very far before it is neutralized; but the entire atmosphere of a bedroom occupied by a patient suffering from a contagious disease is sure to become infected, and the infection often extends to all parts of the house.

Next, let us consider the question, what can be done to prevent or restrict the spread of the contagion which infects by entering the lungs? It goes without saying, to keep away from it is the surest means of prevention. It is practically the same thing to keep the contagion away from us. This may be accomplished by isolating the patient. If the disease be dangerous and much dreaded it would be better, both for the family and the community to have the patient removed to a hospital set apart especially for the treatment of such diseases. I know there is a common prejudice against hospitals, but let me tell you that a person suffering from a dreaded contagious disease always receives better attention in a hospital than it is possible for him to receive in the average private home. There are various reasons for this, but the chief reason is that the nurses in hospitals are all thoroughly disciplined and skilled, and, moreover, their familiarity with contagion removes all fear, so that the patients are not nursed at long range.

If, however, the patient is to be taken care of at home, what precautions should be observed to prevent the disease from spreading? I would advise that the uppermost room of the house be selected as the sick-chamber. Contagion carried by the air is more liable to go upward than downward, particularly if the air be heated. Hence the patient should not occupy a lower room. Ventilation of a sick-room is always important, but especially so when occupied by a case of contagious disease. The nurse, or the person whose duty it is to take care of the patient, should be careful not to come in contact with the other

members of the family. Indeed, she should not leave the upper floor at all, for wherever she goes she is liable to carry and spread the contagion. Even when the well children are temporarily absent from the house, the nurse still should not leave her quarters, else perchance she scatter in her path sufficient germs to infect the children when they return. I wish to impress the fact that contagion can be and often is spread by well persons, and by infected articles. Therefore it is important that no article of clothing, furniture and the like should be carried from the sick-room until disinfected. Neither should nurses, nor other attendants upon the sick, associate with the public until they have had a disinfecting bath and a complete change of clothing.

I wish to condemn the common practice of allowing pet animals into the sick-chamber of children for the children's amusement. The hair and fur of the dog and cat are well calculated to serve as conveyers of the infection. Toys, also, may carry the deadly poison. Letter writing during convalescence from an infectious disease has more than once been the means of spreading the contagion, and should be condemned. The use of books at this stage, particularly those from a public library, is attended by the same risk and should also be interdicted.

Before taking up the question as to the best means of eradicating the contagion from an apartment which has recently been occupied by a patient let us consider first some precautionary measures that may be adopted against a few infectious diseases in particular. Beginning with measles, I would say that this is one of the most contagious of all diseases. When it enters a home it is very liable to attack all members who have not before had the disease. As it is comparatively mild in childhood, and often severe in adult life, there is ordinarily no good reason why children should avoid it. It is contagious from the very beginning of the attack, and continues so as long as there is any vestige of the disease remaining about the individual. There is one thing very peculiar about the contagion of measles, scarlet fever and some other diseases (smallpox excepted), and that is it does not as a rule attack infants at the breast under six months of age.

Scarlet fever is much more fatal among children than is measles, and therefore much more to be dreaded. A larger number of children die annually from scarlet fever than from any other contagious disease. It may be said to occupy to-day the same pre-eminence amongst infectious diseases that smallpox did before the time of vaccination.

Fortunately the infecting distance of scarlet fever is not so great as of measles. Therefore, when this disease breaks out in a family, all the well children should be at once removed in the hope that they may as yet have escaped the contagion. Unlike measles, scarlet fever is most fatal in children at an early age, and much less so in adult life. Moreover, if an individual passes through childhood without taking the disease, there is a probability that he will not take it at all; for susceptibility to scarlet fever diminishes as the child advances in years. Therefore, keep children away from the contagion of scarlet fever as long as possible.

A patient with scarlet fever should, of course, be isolated and kept so until the skin regains its normal condition. You should know that during convalescence the outer layer of the skin peels off, and that these particles of skin contain the contagious principle of the disease. The patient should therefore be kept isolated until this peeling process is entirely completed, which not infrequently takes as long as six or eight weeks. To lessen the risk of these small scales being carried about by the atmosphere, the skin should be kept anointed with some oily substance, such as bacon, olive oil, or cocoa butter. I wish to impress the fact that there is perhaps no other disease, except smallpox, where the contagion clings so long to the body, and therefore I would have you avoid a convalescent from scarlet fever quite as much as you would a person ill with that disease.

Diphtheria, also, often appears in a very contagious form. Perhaps the most contagious part about this disease are the exudations or patches in the throat. The expectoration should therefore be received into a disinfecting solution, such as a strong solution of chloride of lime, or a 5-per-cent. solution of carbolic acid. Inhaling the breath of a patient is also attended by great risk. It is evident, therefore, that kissing persons ill with the disease, however mild it may be, should not be practiced. It should be remembered that the bodies of persons who have died from contagious diseases still retain the contagious principle. I once heard of a mother who forced her children to kiss the corpse of a child dead from diphtheria, and the children subsequently took the disease and perished. More than once contagion has been spread by public funerals. It is needless to say, therefore, that public funerals should be interdicted in every case of death from contagious disease. With the exception of measles, this is made obligatory in this city by the Board of Health.

There is no disease more contagious than smallpox, and none more dreaded by the community. As in scarlet fever, the contagion lingers until all dregs of the disease have disappeared from the convalescent. The scabs often remain on the body long after the patient feels that he has fully recovered; and as long as these remain the individual cannot be said to be free from the infection.

Every case of smallpox should be at once isolated—preferably sent to the hospital. If the first case occurring in a community were treated in this way, and all exposed persons promptly and thoroughly vaccinated, the disease could, without doubt, be prevented from spreading and assuming an epidemic character. As to the value of vaccine protection I shall have more to say presently.

The disease most prevalent above all others, and responsible for a greater loss of life than any other, has quite recently been relegated to the contagious class: I refer to tuberculosis or consumption. It is to be feared, I think, that the talk of late years about the contagiousness of this disease tends to prevent the friends and relatives of the sufferers from rendering to the latter proper attention and kind offices of love, especially during the latter stage of the disease, when assistance and sympathy are so much needed and so warmly appreciated. I feel like saying to you that there is room for serious doubt about consumption being communicable from one person to another by means

of the breath. There is no doubt, however, that the sputa or expectoration contains the micro-organisms peculiar to the disease; but it is a fact of great importance that these germs are not detached by currents of air so long as they are in a moist state. It is not until the expectorated matter becomes perfectly dry, so as to be carried about in the atmosphere, that the danger of infection begins, and even then it is not great unless there be a strong predisposition to the disease.

Now, what is to be done to prevent the real or alleged danger from the contagion of consumption? Simply disinfect the expectoration before it is thrown away. This will destroy the vitality of the germs and prevent all possibility of infection. If the expectoration be received into a 10-per-cent. solution of chloride of lime or a 5-per-cent. solution of carbolic acid, this purpose will be accomplished.

Let us next consider how an apartment may be made safe for occupancy after it has been infected by a case of contagious disease. This brings up more fully the question of disinfection. What is disinfection? It is the act of destroying the vitality or power of propagation of disease germs. Any agent that does this is entitled to be called a disinfectant. Many persons think that all articles capable of destroying bad odors are disinfectants; but such is not the case. An agent entitled to the name "disinfectant" must possess germicidal or germ-killing properties, otherwise it is no disinfectant at all.

Disinfectants, therefore, are the means to be made use of to eradicate infection. It is, of course, impossible to disinfect a room while it is still occupied by the patient. Deodorants may be used to render the atmosphere of an apartment more agreeable, but it is far preferable to get rid of bad odors by cleanliness and ventilation than to undertake to neutralize them. It has been well said that it is better to turn vitiated air out of the window or up the chimney than to attempt to purify it by volatile chemicals, such as carbolic acid, chlorine vapor and the like.

After the patient has recovered and been removed from the sick-chamber, the room and every article in it should be disinfected. Everything that can be washed should first be put into a disinfecting solution and then boiled and laundered. No disease germ can survive the boiling process if continued half-an-hour. All clothing, bedding, etc., that cannot be washed should be disinfected either by hot air or superheated steam. But these agents cannot be very conveniently made use of without suitable appliances. The Board of Health, of this city, has constructed and has had in operation for several years past a disinfecting chamber for the use of the public, where all articles belonging to the poor are disinfected free of charge; the well-to-do people, however, are expected to pay a sum about equal to the cost of doing the work. To disinfect by dry heat it is necessary that the temperature should reach 230° to 250° F.; anything short of this will not insure the destruction of disease germs.

The room itself requires attention after all articles have been removed. If the walls be papered, the paper should be removed, and the walls, woodwork and floor washed with a solution of bi-chloride of mercury, 1 part to 1000 of

water. After this, the woodwork and floor should be scrubbed with soap and water. I wish to caution you against the use of the time-honored feather dust-brush in rooms where infection exists. Disease germs often attach themselves to particles of dust, and when dislodged by the dust-brush are liable to be carried by the atmosphere to some susceptible person. It is far preferable to wipe away the dust by a cloth wet in some disinfecting solution.

The burning of sulphur in an apartment is a common means of practicing disinfection. Recent experiments, however, show that sulphur fumes do not so effectually destroy germ life as was formerly supposed. It is certainly inferior to the use of the corrosive sublimate solution already described. If sulphur be used at all, the room and everything in it should first be well moistened, and then the sulphur burned in the proportion of three pounds to every 1000 cubic feet of air space.

It sometimes happens that infection is introduced into a room having frescoed walls and ceiling. In this case, what can be done to remove the infectious microbes without defacing the frescoing? Some one has suggested that bread may be used for this purpose. That is to say, that bread, having the crust removed, will, when rubbed over such surfaces, mechanically collect all microbes. The bread, of course, should be burned immediately after it has been used.

[TO BE CONTINUED].

Official Dairy Inspection and Sanitary Milk Control.¹

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AS an article of food milk occupies the first and most important place in relation to the health and welfare of the community. Moreover, this relation is not only of the first importance, but it is also a very peculiar one.

Medical and chemical science, and most of all the new sciences of bacteriology during the past twenty years, have shown that the properties of milk are of such a character as to endow it on the one hand with almost ideally perfect qualities for the preservation of health and nutrition, and, on the other hand it may become a terrific engine for the propagation of disease. It contains not only the proper elements necessary to complete nutrition, but it contains these already mixed in the right proportions, and, what is most important to remember in the discussion of this subject, it is *the only complete food which nature supplies to us in the liquid state.*

¹ Abstract of a paper read before the annual meeting of the New Jersey Sanitary Association, held at the Laurel House, Lakewood, N. J., December 9 and 10, 1892.

This condition of being liquid renders it what bacteriologists term a culture fluid. At all temperatures between the freezing-point and 160° milk is in a state of complete readiness and preparation to grow some one or another of the innumerable kinds of bacteria which may get access to it.

In order to grow many different kinds of organisms, there must be a correspondingly large variety of food for them to live upon; and this variety is supplied by milk through its soluble saccharine material which abundantly nourishes the bacteria of souring and fermentation. Its various mineral substances in solution, its lime, phosphorus acid, chlorides, etc., still further contribute to its adaptability as food for bacteria.

What wonder is it, therefore, that in addition to the bacteria special and peculiar to milk, observers have found innumerable others which have come from the air, from the water, from the ground. Not only so, but still others that have come from many other articles of food, and from many sources both animal and vegetable, both those that are harmless and those which are dangerous to life and health.

Sanitary milk control is such an organized system of governmental control, as will fully recognize the teachings of modern science in relation to the peculiar difficulties and dangers which beset the production, handling, sale and distribution of milk. It must provide for the supply of wholesome milk obtained from healthy cows in a condition, when it reaches the consumer, as near the pure state in which it existed in the udder of the cow, as vigilance and forethought can render possible.

I can in no way more strikingly bring out the difficulty of the problem than by calling your attention to the radical method in which it has been proposed by some of the most eminent authorities in Germany to solve it. They have seriously advocated that no raw milk whatsoever should be allowed to come to market, but that before sale all milk should be submitted to a process of complete sterilization. This is the most extreme ground which any one could take. It could be justified only by despair that anything short of it would guarantee the public a supply of safe and pure milk. In other words, that no oversight of the cattle, the stable, the utensils, the milkman, the transport, the middleman and the retail dealer, could be thorough enough to guarantee against impurity and infection finding their way into the milk at some unguarded point.

From a sanitary standpoint this universal sterilization of milk I believe to be wrong, and from a business standpoint that it is utterly impracticable.

The sanitary objections I have stated in the report of the New Jersey State Dairy Commissioner for the year 1891. Milk completely sterilized by repeated continued pressure above the temperature of 212° F., is an artificial altered product. It has neither the appearance, taste or properties of fresh milk. Many different opinions have been advanced as to its digestibility. The earlier testimony that it could in all cases be substituted with advantage in the feeding of infants, has not been borne out by later clinical experience. On the contrary the benefits at first obtained by its use in cases of disordered digestion among

infants are more than offset by the malnutrition supervening later on. The conclusion finally arrived at was that when it is desirable to submit milk to a sterilizing process prior to its use, the sterilization should not be carried farther than that afforded by heating the milk to a temperature of about 160° F. If this temperature is maintained for a brief interval the germs of typhoid fever, pneumonia and tuberculosis are effectually destroyed; and while these pathogenic organisms are killed and the milk is practically sterilized, its taste, appearance, chemical and physical qualities and its value in nutrition, are not sensibly altered. This process, which is termed Pasteurization, may be applied without materially adding to the cost—in large quantities a fraction of one cent per quart covers it. As an offset against this outlay is the increased commercial value due to the fact that Pasteurized milk will keep in hot weather some eight hours longer than unheated milk, and at a temperature of 59° F. it will keep from fifty to seventy hours longer. For these commercial reasons it is possible that the Pasteurization of milk may be adopted in the marketing of the milk supply, and that the community may reap corresponding advantages therefrom.

But it is not my purpose to advocate Pasteurization, and far less sterilization, as a part of any proposed sanitary milk control. All the measures which I shall advocate look towards prevention and not to cure. They aim at improving the quality of the milk supply, and in guaranteeing its purity by whatsoever safeguards legislation and intelligent oversight can provide. There are no bacteria present in milk as it exists in the udder of a healthy cow. They find their way into it either through disease in the animal, or from some outside source. The object of sanitary milk control is to keep them out; it is not to let them in and kill them afterwards. In other words from first to last there must be cleanliness—cleanliness not only in respect to matters which can be seen, but in respect to organisms which cannot be seen, except with the aid of a microscope; cleanliness as the term is understood by the chemist and bacteriologist.

To effect the objects above detailed the work of inspection must begin with the cows and the dairy; provision must be made for systematic official dairy inspection. This will require the services of a corps of inspectors, competent and able, and specially trained to accomplish this delicate and in some cases very difficult and arduous task. At the outset they will need to put into force the provisions of section 2, of chapter 82, of the laws of 1882. This condemns the keeping of the cows in a crowded and unhealthy condition. At the present day everywhere are stables in which there is neither drainage, floor space, air space, ventilation or cleanliness adequate to keeping cows in such condition as is requisite to their supplying wholesome milk.

Second. The quality of the milk should be improved. The State standard of 12 per cent. for the total solids of milk should be raised to $12\frac{1}{2}$ per cent. It should also demand not less than $3\frac{1}{2}$ per cent. of fat. The standard was put down to 12 per cent. in order that all milk taken directly from the cow, however poor the breed, or how poorly fed or cared for, should still be above

the State standard. This is wrong. Even as it is, every now and then some milk from a poorly fed and nourished cow, or one fed with brewer's grains comes into market, and when a fine is imposed because the solids are below 12 per cent., the vendor attacks the law as unjust because without the addition of water his miserable cow falls below the present miserable standard. The addition of water is a commercial fraud, and is only one of the evils which should be remedied by sanitary milk control. In raising the standard of what should legally constitute pure milk, the standard is at the same time raised in everything that pertains to the entire milk industry. If the standard is raised to 12½ per cent. then in the same proportion will be the care and oversight required to see that the feed and keep and breed of cattle are such as will always supply milk of this character. Even at present much of the best milk is supplied under contract of purity, and the intelligent and successful dealer himself with the aid of proper instruments sees that the farmer delivers to him whole milk and exacts a penalty if otherwise.

When the stables in which the cattle were imprisoned and fed on distillery swill and brewers grains, were driven out of New York City by the exertions of its present energetic Health Department, their owners and keepers took refuge on the Jersey side, and are now carrying on a great and flourishing trade. By actual count of the United States Inspectors of Animal Industry, there are at the present moment 2,000 cow stables in Hudson County, wherein Jersey City, Hoboken, West Hoboken, Weehawken, Union Hill and Secaucus are located. These stables are occupied by more than 10,000 cattle, which are chiefly, and in some cases exclusively, fed on brewers' grains. The milk is mostly sent over to New York and retailed there. A year ago the State Dairy Commissioner, Dr. Geo. W. McGuire, and his inspectors devoted much time to their examination, and from fear of exposure and trial some of the stable-keepers have improved their condition. But the system is inherently a vicious one, and must be done away with. In many of the stables there is just room for the cows to stand, their heads nearly reaching the sloping ceilings. The dense crowding renders the heat and suffering in summer very great. The floors are a mass of filth and ordure; drainage and ventilation are matters unthought of. Some of these stables stand over marshes, the water rising nearly to the floor, and in seasons of heavy rain quite overflowing it. So bad is the atmosphere that it takes no small courage to endure the stench for a very brief period.

To obtain pure milk even from a sound cow fed upon proper food would be impossible in such stables. The filth and heat and moisture present all the conditions most favorable to the growth of bacteria. The air, the floor, the water, the surface of the milking vessels, the udders of the cows, and every object that can be seen or touched or handled, swarms with bacteria. Recent biological studies have proven that cows' milk as it exists in the udder of the cow is free from all bacteria of every kind; it is absolutely sterile. By introducing a perfectly clean tube into the teats of the cow such bacteria free milk can be drawn out. Or still more simply, by carefully cleansing the udder and

the hands, and by milking directly into an absolutely clean vessel so arranged as to exclude dust and air, it is possible to obtain milk practically free from bacteria. An approximation to this ideal state of things is maintained in a well appointed and properly kept dairy. The floors, the stalls, the cattle and the utensils are kept as bright and clean as scrupulous care will permit. Milk thus obtained is neutral to test paper and only develops a feebly acid reaction on keeping and requires a great many hours to turn sour. Every one well knows the sweet and pleasant smell and taste of milk when freshly drawn. But the milk supplied by cows fed as above described is of very different character. It has a distinct odor, which is sometimes, and especially in warm weather, anything but inviting. It is alive with bacteria.

These bacteria are among the smallest objects revealed by the microscope. Their name means an organism which has the form of a rod. Often the rod is less than four one hundred thousandths of an inch in diameter, or, in other words, it would take 25,000 of these rods, laid one along side of the other, to make up the width of an inch. The rods are usually more or less elongated, the longer rods being called bacilli. If we consider a species which has the width above given and two and a half times the length, then 250,000,000 arranged on a flat surface would just cover the space of one square inch, and something over 60,000,000 of millions could go into one cubic inch. They grow with astonishing rapidity. The chemist in his laboratory plants a few of them in a culture fluid, and in the course of a few hours he may have a garden containing many millions. I say a garden, because, after much discussion, it has been concluded that they are not animal but vegetable growths. Some of them are perfectly harmless. Others are very useful, such as those which live in the saliva of the mouth and in the alimentary canal, and aid in the digestion of the food. A vast number act as scavengers and convert offensive and dangerous filth, like sewage, into harmless products. The dangerous class are called disease producers, and it is now known that a man cannot contract typhoid fever, or consumption, or scarlet fever, or cholera, except the particular bacillus which produces each one of these diseases is present. If a cow is suffering from tuberculosis the germs of this particular disease are not only present in the meat but also in the milk, and thereby the infection is carried to infants and others using such diseased milk.

While fresh milk drawn from a healthy cow in a clean stable contains almost no bacteria, the numbers present in the swill-milk taken at the stables in Secaucus and the other filthy stables thereabouts surpass belief and entirely exceed our ability to realize or comprehend. One sample of such milk contained over 5,000,000 of colonies of bacteria in a cubic centimetre. Another contained 14,200,000 colonies and a third 16,700,000 colonies of bacteria. Inasmuch as a cubic centimetre is about one-third of a teaspoonful, a teaspoonful of the milk contained over 50,000,000 of colonies of bacteria. In each one of these 50,000,000 colonies there were more single living bacteria floating and wriggling than one could possibly count, however patient he might be and however powerful and excellent his microscope.

Official dairy inspection will prevent the sale of milk from tuberculous and other diseased cattle. The evil must be attacked and put an end to, at the dairy. And the only possible method is to prevent such cows from being used for dairy purposes. At present there is no practical result from the work of the United States and State inspectors so far as diseased cattle are concerned. The State provides that a tuberculous cow may be killed and the owner indemnified by a payment of twenty dollars out of money appropriated to the use of the State Board of Health for this purpose. It has been suggested that the object would be much more certainly and more economically attained by a system of licenses. These licenses should be required of all persons engaged in the production, sale and distribution of milk. They should be issued for a limited period, say for one year, and forfeited on violation of law. They should be granted only after a visit of inspection, which should extend to all the particulars essential to the purity and wholesomeness of the milk.

It has been suggested that the operation of such a system so far as the cattle themselves are concerned, would be in some such manner as follows: After a herd and the stabling and food and manner of handling the milk had been inspected, the minor matters detrimental to the purity of the milk would be rectified at the suggestion of the inspector in order to obtain the desired license. Most of those engaged in milk production where brewers' grains are now exclusively fed, would be compelled to go out of business, or carry it on under different conditions and in more suitable localities. The diseased cattle would be marked, and in case the milk from them was sold the selling would involve not only the imposition of the fine but the revocation of the license. These penalties would follow the milk and would operate upon shippers, middlemen and milk distributors to induce them to protect themselves and see that the provisions under which the licenses had been obtained were duly complied with.

The whole history of the legislation referring to milk, since the first act was passed in this State in 1882, goes to show that the great improvement in the quality of the milk supply has been due only in part to the corrective influence of punishments and fines. Much of the improvement has been due to the education imparted by the inspectors in their visits. And advice which would be resented as gratuitous at present, would be gladly welcomed when it came in connection with the obtaining and holding of a license.

In case of diseases transmissible through milk occurring among the agents themselves, whether producers, sellers and distributors, these agents would not only be liable to the penalties for selling impure milk, but the license would be revoked for the time being, or in case of infraction of the law, altogether.

A vast portion of the milk sold to the poorer classes in tenements and cities, is placed under conditions most unfavorable to its sweetness and purity. In many retail groceries it is dealt in not for profit but for the accommodation and attraction of customers. The can is huddled away under a counter or in the corner of a dirty, ill-ventilated and overcrowded shop. Many persons have access to it, sometimes children suffering from infectious diseases. How different is this from the milk depot in which milk, butter, cheese, eggs and similarly

related dairy products are sold in Rotterdam, Amsterdam and the other cities I have seen in Holland. Their walls and floors and counters are lined with polished white tiles; the cans, which are usually of tin-lined copper or brass, shine like burnished mirrors. It would be a great gain were the handling of milk and related dairy products carried on as a separate business. Then commercial success and profit would dictate the value of extreme cleanliness, and the wisdom of learning everything in the way of detecting impure milk and keeping it in the manner best adapted to preserve its purity. Were the taking out of a special license essential to the handling of milk, it would probably throw the business almost entirely into the hands of those who devoted themselves more particularly to it, and similar products of the dairy.

In that case we should see a general imitation of the methods which have resulted in the production of the very pure and excellent bottled milk that we have been using on the tables of the Laurel House, where this Convention is sitting. It comes from a dairy farm where everything pertaining to the excellence of the milk has been made for many years a subject of painstaking scientific study. The stables are a model of ventilation, drainage, lighting and heating. The water used has been analyzed and has been found of the highest purity. It is laid on in pipes so as to supply it wherever needed under pressure and in great abundance. The cattle are selected for their excellence as milkers and butter makers. They and their stalls, and the whole stable are kept scrupulously clean. All the attendants and help pay great attention to their toilets. The milk is caught in a pail that has been thoroughly cleansed. Then it is weighed, filtered, rapidly cooled out of contact with dust, in a separate room, and when cold is filled into bottles, sterilized by the use of boiling water, and then sealed.

The producer of this milk is his own official dairy inspector, and himself exercises a most solicitous sanitary milk control. He has invested knowledge, unwearied industry and attention, a supply of proper books and scientific instruments, a suitable farm, a specially constructed barn and dairy, enterprise and capital in the business of supplying milk which shall be as delicious to the taste, as wholesome and as pure, as all these qualifications combined can make it. He has succeeded, and the investment pays.

This is an object lesson on a large and practical scale. The purpose of official dairy inspection and sanitary milk-control is to educate milk producers generally to a perception of the profit and wisdom of doing the same thing, and to stimulate this progress of education by all appropriate legal measures in case the lesson is not learned, or if learned, is not carried into faithful practice.

Two drops of camphor-water on your tooth-brush, says an exchange, will give your mouth the freshest, cleanest feeling imaginable, will make your gums rosy, and absolutely prevent anything like cold sores or affections of your tongue.

The Climatic Features of the Pines of New Jersey.¹

BY DR. ISAAC HULL PLATT,
Of Lakewood, N. J.

Member American Climatological Association, Fellow New York Academy of Medicine, etc.

IN all times pine regions have been regarded as health-giving. As far back in history as the classic eras of Greece and Rome physicians were in the habit of sending patients suffering from pulmonary diseases to regions of pine forest, where it was believed that the balsamic exhalations with which the air was laden, restored them to health, or at least enabled them to live in comparative comfort.

Pliny, in his *Natural History*, says that "it is a well-known fact that forests planted with trees from which pitch and resin are extracted are remarkably beneficial for patients suffering from phthisis, or who are unable to recover their strength after a long illness. Indeed it is said that in such cases, to breathe the air of localities thus planted, is more beneficial even than to take a voyage to Egypt."

Such terms as "balsamic influence," "health-giving emanations," "aromatized atmosphere" which have always been in popular use in connection with pine growing regions, while devoid of scientific meaning, at least give testimony to the universal belief in the salutary influence of the pines. Such beliefs are usually in some degree at least true, because founded upon a vast, if not very exact experience, and in this case it has been confirmed by more precise and careful observation, and the proposition that the regions of ever-green forests do exercise a beneficial influence upon patients with pulmonary disease is undisputed by the medical profession.

At present this form of climatic treatment is mainly empirical. It is believed that residence in pine growing regions benefits certain classes of invalids, because they have been observed to grow better there. The medical profession does not, however, rest satisfied with this fact learned from experience, but seeks its cause, and several theories have been advanced to account for it.

It has been suggested that the friction of the air, blowing against the sharp pine needles may produce an electric condition of the atmosphere which tends to its purification, but so far as I am aware this view has not been supported by experimental proof.

It is well known, however, that growing pine is rich in substances of an antiseptic nature. Turpentine and its derivatives certainly have power to retard putrefactive changes and to prevent or retard the development of disease germs. Moreover, turpentine is very volatile and to a certain extent pervades the atmosphere of pine regions. It is difficult, however, to believe that a sufficient quantity can be taken up by the atmosphere, especially in winter, to exert an antiseptic action.

¹ Read before the Annual Meeting of the New Jersey Sanitary Association, held at the Laurel House, Lakewood, N. J., December 9 and 10, 1892.

There is a modification of this view, however, which deserves consideration. It is well known that peroxide of hydrogen is one of the most powerful of antiseptics, liberating nascent oxygen, which is nearly identical with ozone. It has been shown by Mr. C. T. Kingzett "that when turpentine is exposed to the action of air it absorbs oxygen and gives rise to the production of a peculiar organic peroxide, which remains dissolved in the body of the oil and communicates thereto properties resembling those of peroxide of hydrogen. Inasmuch as the oil is volatile, these properties are communicated to the surrounding atmosphere." Here is at least a possible explanation of the supposed antiseptic action of the air of pine forests, and it receives the support of as high an authority as Dr. A. L. Loomis, who believes that while the antiseptic properties of such an atmosphere may not be sufficient to destroy the bacteria, they are sufficient to prevent or retard the production of their poisonous products.

So much for the alleged antiseptic influence of evergreen forests. They have another feature, however, that deserves consideration, and that is the peculiar nature of the soil upon which they grow. May it not be that there is something in the nature of the soil which favors the growth of pines and other evergreen trees which is inimical to the production of disease germs? Not by producing any substance antagonistic to them, but by refusing to afford conditions favorable for their germination and development.

The purest atmosphere is found at sea, and it has long been noticed that seafaring people are remarkably free from consumption and that the disease is incomparably rare in navies than in armies. On the other hand, the dry air of the desert is also exceptionably pure, while the atmosphere of rich tropical jungles, luxuriant with their wealth of rank vegetation and of low damp bayous, is notoriously productive of disease. Here extremes seem to meet—the dampest air, that of the ocean, and the driest, that of the desert—are alike pure and free from germs.

It was shown by the late Dr. Henry I. Bowditch that there was a direct relation between soil dampness and the prevalence of consumption. That rich loamy soil so much desired by the agriculturist was favorable for the development of tuberculosis. Dry, rocky or sandy soil, unfavorable for agriculture, was also unfavorable for the then unknown cause of tuberculosis.

The result of his investigations have been confirmed by Simon and Buchanan in England, and by Pepper in Pennsylvania. Since the discovery of the specific germ of tuberculosis this result is seen to be perfectly rational. The rich moisture-holding soils are particularly favorable not only for the growth of vegetation, but for its decomposition and the production of the pabulum upon which organisms thrive, therefore the air of such regions must be impure, while the air of sterile regions and of the sea, where there is no vegetable life, is comparatively pure. Granting then that there is a relation between atmospheric purity and health which cannot be denied, the bearing of these facts becomes clear. It is not dampness *per se* which causes disease, but dampness under such conditions as to produce rank vegetation and the decomposition of organic matter.

Pines, I believe, grow almost invariably in dry, sandy, sterile soil, at any rate such is the character of the soil in the pine region of New Jersey—the pine barrens as it is called. As you drive about the neighboring country you will observe that when you leave the artificially graveled roads, you are in a region where the portion of the planet beneath your carriage wheels—it cannot be called soil—is almost as pure sand as a sea beach.

The pine region of New Jersey may be roughly described as a tract of land about sixty miles in length and from eight to twenty miles in breadth, reaching from the neighborhood of Freehold to that of Vineland. South of Vineland there are indeed pines, but there are other features of the country there which change its character and render it less desirable from the standpoint of the sanitarian. Excluding the seaboard townships, this tract corresponds approximately with the townships of Howell, Jackson, Manchester, Southampton, Woodland, Shamong, Winslow, Hamonton and Lakewood. Excluding the last, of which there are as yet no statistics, the vital statistics of New Jersey showed for the six years—from 1883 to 1888 inclusive—a death rate of 12.16 per thousand, while the death rate for the whole State during this period was 18.65, and for the State, excluding cities and towns of over 5,000 inhabitants, 15.07 per thousand. The death rate from consumption in this region was 1.60 per thousand, while for the whole State it was 2.53, and for the State, exclusive of towns as aforesaid, it was 2.12. This statement will appear the more striking if it be borne in mind that this represents the poorest portion of the State, and that where the unhygienic conditions consequent upon poverty are the greatest. The soil of this region, according to Cook's *Geology of New Jersey*, varies from a light, sandy loam, containing 85 per cent. of silica and $1\frac{1}{2}$ per cent. of water, to an almost pure quality sand, 95 per cent. silica and containing only 6 per cent. water. Of course such a region is sterile in the extreme, vegetation sparse and consisting largely of pine, the soil so light and porous as to be capable of containing but little moisture, it being rapidly drained through the interstices of the sand.

I had hoped to be able to present at this time the results of meteorological observations taken at this point for the last two years. The absence of the observer in Europe, and my inability to obtain access to his papers unfortunately precludes this. I shall try to have the results published in the near future. At present I can only say that the gentleman referred to has frequently told me that his observations, which I know to be careful, show a markedly lower relative humidity than that of New York City. I, however, regard the question of relative humidity as of less importance than that of soil moisture, though there is undoubtedly a connection between the two.

I have always sought to avoid making claims for this region which could be thought extravagant, but we are at least justified in saying that we have a region characterized by such negative conditions as tend to render the air aseptic, by the absence of soil moisture and soil putrefaction, and by such positive antiseptic action as the air of pine forests is able to afford.

We have a region free from malaria, a region with a comparatively dry and

pure atmosphere, which is indicated in pulmonary and bronchial diseases and catarrhal conditions of the air passages in general, and one of value in cases of chronic rheumatism, and, as I believe, in some forms of Bright's disease. These views have been borne out by experience during six years' practice at this place. It is not claimed for the region that it has any such remarkable therapeutic influence as the high altitudes of Colorado and the Alps seem to exert over certain selected cases of pulmonary phthisis, but it has the great advantage over these of easy accessibility, is applicable to a greater range of cases, and is an excellent refuge for invalids from the deleterious effects of residence in the relatively impure atmosphere of more thickly settled and more fertile regions.

One other and very important point, which I hope the personal experience of each of you, before you leave, will bear me out in maintaining; there is no lack of comfortable accommodations here for the sojourner in pursuit of health.

Disposal of the Dead.¹

BY G. C. KINGSBURY, M.D.,
Of Mount Carmel, Ill.



UMAN life possesses, to true Christian people, two elements or natures—a human, material or mortal nature, and a divine, spiritual or immortal nature.

The phenomenon we call death separates these two natures; the spiritual returning to God and divine means or agency for its disposal, the human remaining a foreign substance for the living to dispose of according to their peculiar modes, belief or necessity. There are very few subjects which present so many, varied, important and different ideas for consideration. Every department of learning is interested, the divinity scholar, and our own Christian conscience, directed and aroused by scriptural doctrine, demand consideration on the final disposition of this body. As to the mode taught by the Scriptures.

Have we, taught by the Scriptures or directed by the example of Christ, a mode from which we should not depart?

The question presents itself to our legislative bodies for consideration—

(1) Can legislation be such as will deprive us of that liberty, which is to a great extent a personal one, of disposing of the bodies of our friends?

(2) Can legislation be such as will compel obedience to any the law may prescribe?

(3) Would it have a tendency to prevent the detection of crime if the law compelled such a mode as would destroy the body?

The political economist must also share in solving the question. Would they demand such a disposal of the dead in view of loss or gain to our economic principles?

¹ Read before the Mount Carmel Scientific Society.

The press is called upon to create and satisfy public sentiment.

Upon the sanitarian rests the solution of deep and important questions directly connected with this work. To what extent and how is public health impaired? The medical profession must take an intelligent, practical and active interest in the matter. And chief among all, the scientist must solve the underlying principles from which the others, to a great extent, must be governed.

What scientific principles are involved and dependent upon the solution of the subject? And along with each class a sentiment exists as to our like or dislike; a repugnance to or approval of our sentiment must and does govern us in a decision on the mode. And now, while all and each of these classes and individuals are intimately concerned in the committing of our dead to their final earthly abode, we must, in this paper, confine our investigations and inquiry to a strictly scientific and hygienic consideration. And in doing so, I hope I will not be understood as a materialist, or in the least objecting to the Christian, divine, legal or sentimental principles which we all more or less must possess. And allow me to state, by way of digression, that this subject is yet in its formative stage. Little has been thought or done to mould public sentiment and ideas on the subject. Scientific investigation has hardly been thought of, much less given complete control of the disposal of the dead.

I submit five propositions which will form a basis for scientific thought, and which science must defend and satisfy before we have scientifically disposed of our dead:

(1) The dead body possesses elements or properties which are common to the natural elements and physical world. It is composed of carbonic acid, water and ammonia, constituting the gaseous elements which go into the atmosphere.

(2) Mineral constituents more or less oxidized, elements of the earth's structure, lime, phosphorus, iron, sulphur, and magnesia.

(3) Nature, or the elements and the physical world demand, and science sustains this demand, that these natural elements residing in the human body be restored to nature as their ultimate constituents.

(4) It is the duty and province of science to surrender to nature these natural elements in the quickest and most scientific manner, both as regards the most complete surrender, and at the same time the most perfect protection to living human beings.

(5) The scientific disposal of the dead embraces the economic principles of returning these properties to nature in a way which will provide the least amount of territory or space.

In support of these three last propositions I will quote from Sir Henry Thompson, Professor of Clinical Surgery in the University College of London.

"Since every dead body enters sooner or later into the vegetable kingdom, and reconstructs the broken down chemical powers, sustained by constant demand made upon nature, let us glance at the economic view of the subject for it is not so unimportant as, unconsidered, it may appear. It is an economic question whether we will it so or not. No doubt a sentiment, repugnant to any such view, must arise in many minds. A sentiment altogether to be held in

respect and sympathy. Be it so; the question remains strictly a question of prime necessity in the economic system of a crowded country. Nature will have it so whether we like it or not. She destines the material elements of my body to enter the vegetable world on purpose to supply another organism which takes my place. She wants me and I *must* go, there is no help for it. How shall I follow; with quick obedience or unwillingly, truant-like, traitor-like to her and her grand designs?

Her capital is intended to bear good interest and yield quick return. Shall her riches be held in earth to corrupt and bear not present fruit, or be utilized without loss of time, value or interest for the benefit of starving survivors.

Nature hides no talent in a napkin. We, her unprofitable servants only thwart her ways and delay the consummation of her will.

In order that we may ascertain how perfectly we satisfy these propositions and whether we assist or retard Nature in taking possession of her own, let me present the different modes which have been practiced by different people according to their belief, customs or necessity. The first probably to be considered was the manner in which primitive man, following their instincts perhaps more than science, buried them or placed them in remote or inaccessible places. The Ethiopians placed the corpse in a glass column, where it remained for a year, after which the remains were buried outside the cities. Certain vague ideas of salubrity seem to have, in all ages, entered more or less into the question of interment. Tradition relates that certain tribes of Troglodytes threw stones upon the body until it was covered with the mass, when it was left to the mercy of the elements. This is still common among the Arabs.

The Assyrians put the remains in honey as a method of preservation.

The Persians left their dead to be torn in pieces by dogs and birds of prey before giving them burial. Certain tribes about the Caspian Sea carried them into the desert and left them to be eaten by animals or birds of prey. The Scythians before burying a body carried it about during forty days in a cart to the dwellings of all persons who had known the deceased, to pay, as it were, a formal visit. The German tribes buried their dead on a funeral pile and then made a mound of green earth over the ashes. The Indian tribes, actuated by a desire to preserve the body from wild animals, enveloped it in a skin or bark and placed it on platforms supported by poles. The Hebrews practiced inhumation and it was general among them in the time of the patriarchs. Caves were generally preferred to graves.

The manner of disposal of the dead by the Parsees suggests to us a more decided, humane and safe mode. It consisted in placing the body in a tower and after the soft tissues were destroyed by vultures, the bones were deposited in the walls.

The catacombs, I will merely mention, the burial being familiar to us and it not providing scientific answers, it being too extensive to permit of an elaborate consideration.

The Roman and Greek forms were analogous. Burial was the earlier custom. Burning was not general till the republic, but was universal under the empire.

More advanced in Christian and scientific knowledge came the Egyptian mode of embalming, which was practiced in two principal ways: 1st consisted in passing drugs through the nostrils into the cavities of the skull, removing the organs and applying palm, resins, cassia, then steeping the body in natron seventy days, then wrapping it in linen cemented by gums and set up in a coffin against the walls of the house or tomb; the second process consisted in removing the brain and injecting the organs with kedron or cedar oil and immersing the body in a solution of natron for seventy days, which brought away or destroyed the organs and soft parts, leaving the skin and bones. A year after it was taken to the tomb or catacomb.

Christians viewing these modes of disposal as contrary to Scripture, the common mode of burial was instituted. About 750 spaces of ground adjoining the churches were carefully enclosed and consecrated to the burial of the dead, hence our custom of to-day. Now our propositions demand that our dead be restored to nature, and that it be done completely, perfectly, quickly, without endangering the living and without unnecessary loss of territory or space, so in our consideration of the different modes do we find these propositions satisfied; if not, we must conclude that nature has been defeated, robbed of her rights and retarded in her work. We must do one or the other. If we thwart nature, we thereby expose ourselves to the consequences. And what are they? Just the reverse contemplated in these propositions, viz., withholding her property, thereby impoverishing her. True in these modes Nature finally asserts her authority, and takes possession, not quickly, or perfectly, and, most fearful of all, not before living beings are exposed and suffer awful consequences. Especially is this true of our common form of interment.

I have not been able to obtain statistics of disease and death caused by this; it cannot be obtained. So much is known that almost every sanitarian fears that harm is being done, and until a scientific investigation has been made, we, of course, can produce no reliable figures. I can, I think, consistent with medical teaching, say positively that harm untold and epidemics most fearful have resulted from this. How else could it be! Over 2,000,000 beings buried every year in our country, the population increasing, cemeteries being intruded upon, burial places long abandoned now being unearthed for municipal and agricultural purposes, those so carefully laid at rest, as we believed, brought forth, displaced, disturbed by our onward and relentless march of improvement. There is no safety in living near a cemetery. We know not when our drinking water will be polluted and offensive gases be emitted to poison and corrupt the atmosphere.

An article written for the *Chautauquan* presents the expression of a distinguished man. "The slightest inspection shows that the putrid gases are not thoroughly absorbed by the soil lying over the bodies. I know several churchyards from which most fetid smells are evolved, and gases with similar odor are emitted from the sides of sewers, passing in the vicinity of churchyards, although they may be more than thirty feet from them. It is estimated that 80,000 interments occur annually in London, from which nearly 4,000,000

cubic feet of gases are emitted, the whole of which beyond what is absorbed by the soil must pass into the water below or the atmosphere above. 16 per cent. of deaths every year are due to zymotic diseases—small-pox, scarlet fever, measles, diphtheria, typhus fever, dysentery and cholera. These diseases are preventable to a great extent if we are but willing to obey sanitary laws. Epidemics and plagues have been traced to old graveyards, for instance the epidemic of yellow fever in New Orleans in 1853; it was found that in a certain district the rate of mortality was more than double that in any other part of the city, and the cause was found in three cemeteries in that district, in which there had been interred the preceding year 3,000 bodies. Thompson says, “thousands of human lives have been cut short by the poison of slowly decaying and often diseased animal matter, even the putrefaction of some of the most insignificant animals has sufficed to destroy the noblest, and in time of pestilence the continued polluted air and water has been due to the poisonous influence of buried victims.

I have here a book on cremation, written by Prof. Hugo Erickson, one of the most scientific men of the day, who presents the subject in a most lucid, practical and convincing manner. First he asks, “What is burial? For what purpose do we place the bodies of our dead in the earth? It is the beginning of a chemical process, a process which ends finally in the total dissolution of the corpse. The chemical constituents of our body are returned to Nature. Burial and cremation are in a sense the same; in either case the body oxidates. The great distinction between the two lies in the fact that the burning in the grave requires years for its completion, and is fraught with danger to the living, whilst in case of incineration the body is reduced to its primitive elements in the brief space of a few hours, and is unaccompanied by anything that may do harm.”

In speaking of overcrowding of cemeteries he presents New Orleans as an example. “At all times the dead have been disposed of in a very careless manner in New Orleans. It is related that during the yellow fever epidemic of 1853, when the city had a population of 150,000 inhabitants, those that had died of the dread disease were thrown into trenches not over eighteen inches or two feet deep. In a graveyard situated in the central part of the city were buried in this manner 400 bodies, recent victims of yellow fever, and contaminating the air with poisonous exhalations. The mayor of the city was asked to remove the dangerous condition of the burial ground; he replied, ‘that’s not my business.’”

At present they have a system of entombment in the crescent city. These tombs are in the municipal cemeteries, thirty-five of which are within the city limits, giving them the appearance of a collection of baker’s ovens. They vary in size from 3×6 to 10×20 ; there is a post in the centre which is surrounded by shelves, on which the coffin is deposited. There it rests about a year, when it is taken from the casket and cast into a pit, there to breed disease. “What wonder,” exclaims Kate Field, “that yellow fever runs riot in New Orleans, when the air reeks with the fostering corruption of thirty-five plague spots ex-

posed to a tropical sun. Think how the death rate of that city might be reduced by cremation."

It is clear that overcrowding of burial grounds must lead to evil consequences. A ground that is saturated with putrefying material can emit naught but poisonous odors, cannot fail to contaminate the purest and clearest water, must vitiate any atmosphere.

Dr. Ayr claims that the graveyard gases can extend to a distance of a hundred meters. The danger is not obviated by deep burials. In that case the morbid matter is diffused through the subsoil.

Haguenot reports that, in 1744 the corpse of a monk of the Penitent order, who had been buried in a vault under the church, was exhumed in the church of Notre Dame, at Montpellier, France. A man descended into the vault to remove the cadaver, but before he got quite down, he was taken with convulsions and died of suffocation. Three others lost their lives trying to rescue one another.

Dr. Adalbert Kueltlinger brings forward the sequent case to prove the deleterious action of cemetery gases. A very obese lady died during the month of July, 1854. Previous to death she had requested, as a special favor, that her remains be buried in the church to which she belonged. After her demise she was interred in a vault of the church, and the next day the minister delivered the funeral oration. This was on Saturday. On the following Sunday, the Protestant clergyman preached to an assemblage of 900, who came to attend the Lord's Supper. In Germany, people fast before they communicate. During the sermon the vault was uncovered. There were 180 communicants. One-quarter of an hour after the solemnity, before they had time to leave the church, sixty became ill. Some died in severe convulsions.* There was a belief that the wine used had been poisoned. The sexton and some other individuals were imprisoned. The second Sunday from the time of the fatal occurrence, the city authorities ordered that a chalice should stand uncovered on the altar one hour. The time had hardly passed when it was noticed that the wine was covered with little insects, which by means of sunbeams were traced to the grave of the corpulent lady who had been buried fourteen days before. Four men were commissioned to open the vault and remove the coffin. When they attempted this, two of them died at once, and the others were only saved by the physician.

Prof. Victor C. Vaughan, M.D., Ph.D., of the University of Michigan, in a paper on Water Supply, at a Sanitary Convention at Ipsilanti, Michigan, July 1, 1885, states, "To show you the stupidity and recklessness of people which is manifested concerning the contamination of water, I will mention the following case:

A little village by the name of Richland is situated in a beautiful farming country. A few years ago the village board desired to select a new site for a cemetery, and chose one within thirty rods of a well owned by Dr. Patchin. The doctor objected to the location, and as a result there was a lawsuit. It became a question as to whether there was a possibility of contamination of this

well from burying bodies in this new cemetery. I was called, and after studying the geological formation, concluded that there was a possibility of such contamination.

I was met in court with the statement that it would be impossible for any of the water falling upon this cemetery, thirty rods distant, to reach the well, because all the water that goes into a well is that which falls upon a surface which will be enclosed in a circle whose centre was the mouth of the well, and whose radius was the depth of the well. I related the case to Dr. Langley and he proposed an experiment. He tested the water of the well for litheum and found it absent; then had litheum sown over the proposed cemetery and then examined the water of the well each day thereafter, and on the eighteenth day litheum was found, showing that water did pass from the cemetery to the well.

Notwithstanding this the judge allowed the cemetery to be located there. As a result, the families had to discontinue the use of their well water.

Prof. Pumpilly has made certain that sandy soil does not prevent bacterial infection from entering a well situated a considerable distance from cesspools and cemeteries."

Dr. John V. Marble, of Worcester, Mass., says: "The monstrous delusion that the mere contact of the corpse with fresh earth renders it innocuous, and suffices for safe disinfection, is dissipated by overwhelming evidence."

Dr. Wm. Porter, of St. Louis, Mo., has recorded the following case: "A young man died from diphtheria and was buried in the village churchyard. At some little distance was a well, from which the people drank each Sunday. Was it not suggestive that twenty from this congregation died from diphtheria while this impure well was in use?"

Dr. Buck says "it is impossible for any one to say how long the *materia morbi* may continue to live under ground."

In 1852 a man who had died of small-pox thirty years ago was dug up in Chilwood, a village near London, England. The person had been of consequence, therefore a good many people attended the exhumation. A few days after fourteen persons contracted small-pox. Louis Pasteur, the great French investigator, says: "Recently we discovered the characteristic germs in pits in which animals dead of splenic fever had been buried for twelve years, and their culture was as virulent as that from the blood of an animal recently dead." Dr. Robert Koch, of Berlin, detected the bacillus tuberculosis: "There is no doubt to my mind but that consumption can possibly be spread by the upturning of the soil of a grave containing the victim of tuberculosis."

In 1826, when cholera made its appearance in Egypt, the French government sent out medical officers to discover its origin. It was traced to an old and deserted cemetery at Kelioub, near Cairo. The outbreak of cholera at Modena, Italy, in 1828, was shown by Prof. Bocenchi to be due to the upturning of the ground of burial yards in which victims of the plague had been inhumed 300 years before.

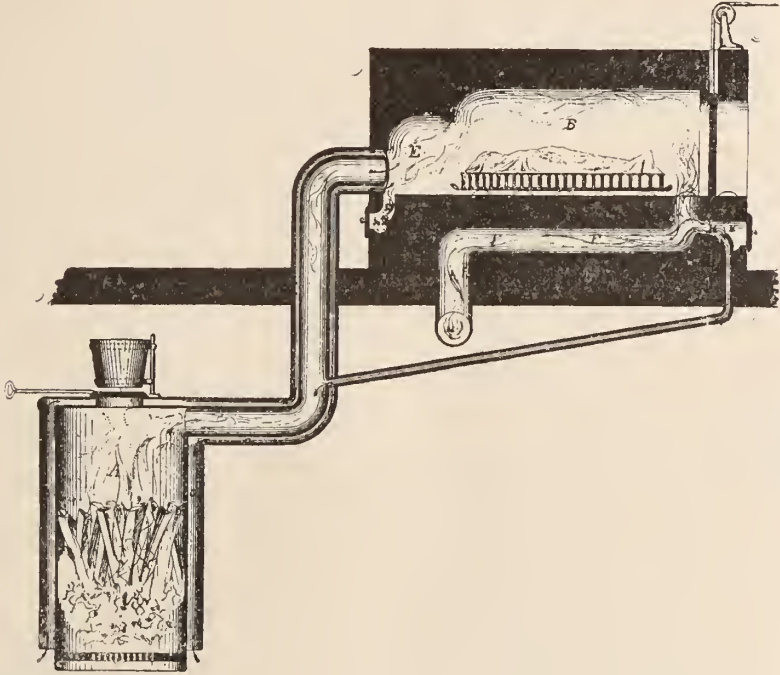
The scientific world was recently startled by the gladsome news that Dr. Domingo Freire had discovered the peculiar microbe of yellow fever. "The blood

of yellow fever patients swarm with these microbes (cryptococci). Dr. Freire examined some soil from the cemetery where victims of the yellow fever lie interred. Some of this earth was dried and then placed in a cage containing a guinea-pig. Previously to the introduction of the earth the blood of the animal was examined microscopically and found to contain no bacteria of any kind. The animal became ill and died within five days. When its tissues were examined after death they were found to present all the characteristic change of yellow fever. The blood was full of *cryptococci xanthogenici*."

Sir Spencer Wells gives the following: "Some persons who had died of scarlet fever were interred in a country graveyard; thirty years after the cemetery was included in a neighboring garden and the old graves dug up. Scarlet fever forthwith broke out in the rectory and parish." But certainly it is not necessary for me to add more to convince anyone that we are in constant danger from our common mode of burial. Neither do these modes dispose of the bodies so as to provide the least amount of territory or space. Our cities of the dead will become the most densely populated ones. In support now of our proposition that these elements must be restored quickly and completely when and where needed. Nature, permit me to again quote Sir Henry Thompson: "London had in 1871 8,254,260 persons, of whom 80,430 died within the year. I conclude, after a very carefully made estimate, that the amount of ashes and foul earth, such as is derived by perfect composition belonging to and buried with those persons, is by weight about 206,820 pounds. The pecuniary value of this highly concentrated form of animal solids is very considerable, for this foul earth may be regarded as equal to at least 407 times its weight of dried but unburned bones. The assortment of other solid matter resolvable by forming into the gaseous food of plants, but rendered unavailable by burial for, say fifty or one hundred years, is about 5,584,000 pounds, the value of which is quite incalculable. This is for the population of the metropolis only. That for the same year was 81,488,700 pounds for the United Kingdom. Taking into consideration a somewhat lower death rate for the imperial average, it will at all events be quite within the limits of truthful statement to multiply the above by nine in order to obtain the amount of valuable material annually diverted in the United Kingdom for a long term of years from its ultimate destiny by our method of interment." England then losing 50,256,000 pounds, a population of nearly double that we lose 629,967,400 pounds.

In view of these facts, and not finding science at our command in these modes, what have we left, or what process will be a satisfactory solution to our proposition? In answer to this, I submit as the only mode to perfectly do so, is cremation. In support of this, I present publications and information, very kindly sent me by Mr. James Inglis, of the Troy Crematory, giving a description of the beautiful Earl Crematory, also papers of the crematories of Buffalo and Lancaster. But, first again, Sir Henry Thompson says: "Given a dead body to resolve it into carbonic acid, water, ammonia and mineral elements, safely, and not unpleasantly, the gases can be driven off without offensive odor; the

mineral constituents will remain in a crucible; the gases will, ere night, be consumed by plants and trees; the ashes, or any portion of them, may be preserved in a funeral urn, or may be scattered on the fields." This mode presents for our consideration a beautiful building; the body is taken charge of by careful attendants, and everything tends to rob the harrowing and distasteful methods practiced by our ordinary method of disposal.



You see by the plate, first a gas generator (*A*) which is simply a fire-proof pot. The air for combustion is admitted through a grate in the bottom. The result is the gases of distillation and combustion of wood are carried to the back end of incinerating chamber (*B*) on the floor above. Here the gases are met by air heated in a chamber (*C*) outside of the furnace, where the two are ignited by a fire (*D*) which is kept burning just under the point of union. The Bunsen flame (*E*) thus produced, is thrown quite across the incinerating chamber, thence it is carried back beneath the retort by the flue (*F*) into the basement to a chimney, and so to the open air. The body is not touched by the flames from the wood, the process of incineration being completed by the burning gases in the flues and retort. The ashes are gathered from the trough and placed in an urn.

I now leave the subject of cremation with you, fully asserting that it completely satisfies every proposition. By this mode Nature receives her own in a perfectly clean and complete way, and, especially, does it protect the living from these highly dangerous poisons of the dead. We, as sanitarians, must look earnestly and quickly in this matter, or we, and generations following, will have to pay an awful penalty.

THE ANNALS OF HYGIENE.

The State Board of Health is not responsible for anything appearing in this Journal except that which bears the official attestation of the Board.

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EDITORIAL

All subscriptions to "THE ANNALS OF HYGIENE" are taken "until ordered discontinued," and no agent has authority to make any other arrangement. At end of time to which subscription has been paid or promised, a bill for a year in advance, with return envelope is sent, and if journal is no longer wanted, all a subscriber has to do is to mark "Discontinue" on the bill and return to us. A failure to return bill is considered an order to continue.

National Quarantine.



THE following circular, recently received by the editor of this journal, touches a question so vast and so vital, that it is deemed well worthy of reproduction, that all thoughtful readers of THE ANNALS OF HYGIENE may be afforded the opportunity of enriching the New York Board of Trade and Transportation with their views on this subject. Our own views, briefly expressed, are very decided on this subject. We believe that quarantine is less efficacious than universal sanitation, that is to say, we believe that greater practical results will be achieved by such a state of national cleanliness as will offer conditions inimical to the growth and development of the cause of disease than will be secured by the most rigid and most complete measures for the exclusion of these causes. But, we believe that it will be some years before the popular appreciation of its value will make such universal sanitary cleanliness a reality, and, such being the case, we are quite well satisfied that a well-ordered quarantine, for a few years to come, is an absolute necessity. Granting then, that quarantine is desirable, we cannot see how there can be any difference of opinion as to the advisability of a national system, directed from the seat of Government at Washington.

ROOMS OF THE NEW YORK BOARD OF TRADE
AND TRANSPORTATION,

55 Liberty Street,

NEW YORK, December 5, 1892.

A Special Committee of the New York Board of Trade and Transportation has been appointed, pursuant to resolution, and is seeking information, data and opinions touching quarantine, and the advantages, if any, of establishing a uniform system in the United States, under the management of the General Government; the intention being, if the weight of opinion and evidence favor the proposition, to prepare suggestions for Congressional legislation on the subject.

The members of the Committee are:

Hon. Oscar S. Strans, *Chairman*.
 (Ex. U. S. Minister to Turkey), of L. Straus & Sons, Importers of China, Glass, etc,
 Mr. Jeremiah Fitzpatrick,
 of J. Fitzpatrick & Co., Importers and Manufacturers of Plate Glass, Looking Glass, etc.
 Mr. Edward H. Cole,
 of The Eaton, Cole & Burnham Co., Well Machinery and Brass Goods.
 Mr. Elias S. A. De Lima,
 of D. A. Le Lima & Co., Foreign Commission Merchants.
 Mr. Ambrose Snow,
 of Snow & Burgess, Shipping and Commission Merchants.

The Committee have adopted the following line of inquiry, and invite such suggestions and opinions thereon as they may be willing to make public, from experts, and professional men having practical experience of sanitary affairs and from others having opinions on the subject:

(1) Quarantine administration in foreign countries as furnishing precedents for the United States.

(2) The present status of quarantine in the United States: A. *National*; B. *State*.

(3) The existing system of quarantine administration in the United States: A. *Cost*; B. *Restrictions imposed on commerce and travel*; C. *Security afforded*.

(4) A national quarantine: A. *Would it lessen the existing imposts upon commerce?* B. *Would restrictions on commerce and travel be less injurious?* C. *Would it afford increased security to the country?*

Persons writing the Committee are requested to affix to their names their professional or special titles, if any, and to address their communications to Hon. Oscar S. Straus, *Chairman*, 55 Liberty Street, New York, N. Y.

Respectfully, etc.,

DARWIN R. JAMES, *Secretary*.

Pettenkofer and Cholera Bacilli.



NE swallow does not make a summer, neither does one "swallow" of cholera bacilli, with impunity, disprove the claim that these bacilli are the cause of cholera.

With this cautionary paragraph we chronicle the fact that Dr. Pettenkofer, of Munich, a sanitarian of deserved world-wide fame, has swallowed several million cholera bacilli and that he did not have cholera. The sensational newspaper reports of this gastronomic feat have been supplemented by an article, in the *Lancet* from Dr. Pettenkofer himself, in which he recounts the details of this daring if not conclusive experiment. Remembering that Dr. Koch states that the comma bacilli are destroyed by the acid of the gastric juice, Pettenkofer chose an hour of the day when there was the least quantity of gastric juice in his stomach and he then drank some water containing millions of comma bacilli. He furnishes a detailed account of his symptoms, but, "to make a long story short," we find that beyond a slight diarrhœa, no evident effects were produced. This experiment was followed by a similar one by Professor Emmerich, with like results; and then Dr. Pettenkofer says, "*These two experiments on man show that the comma bacillus does not generate the virus of Asiatic cholera.*" The great doctor describes himself

as "seventy-four years old, have had glycosuria for years, have not a single tooth in my head, and only use my artificial teeth when I have to make a speech, not needing them for mastication; and I also feel other burdens of advancing age." Now, to one who is but half of seventy-four, who has no organic or functional disease, and who has plenty of his own teeth, this italicized deduction of the distinguished, but, from his own admission, antique, German savant does not seem well founded.

Again must we repeat our oft-repeated statement that soil as well as seed is necessary for the production of disease and, to our way of thinking, this experiment proves nothing more than that Dr. Pettenkofer enjoyed an immunity from cholera; that his body did not offer a soil suitable for the development of the disease.

We are not bacillus-mad; we are in a very open frame of mind in reference to the part that these germs may play in the cause of disease; we are not at all prepared to say that it has been indubitably proven that Koch's comma bacillus is the cause of cholera, and we are heretical enough to question whether such absolute proof will ever be forthcoming; we sometimes feel that such knowledge is unfathomably buried in the depths of the unknowable; we are quite ready to listen respectfully to any arguments that may be advanced either for or against the comma bacillus as a cause of cholera; but when a sanitarian, whose opinions have carried so much weight for so many years, as have those of Dr. Pettenkofer, asserts that an alleged cause of a disease is not the cause *because he and one of his associates consumed numbers of these alleged causes, yet did not have the disease*, we must ask the public to take cognizance of the faulty aspect of such logic and not "sheep-like," to become stampeded to the other extremity of this delicate and mysterious problem.

While we do not now, and may not ever, know with certainty the cause of cholera, we do know how to avert its ravages, and it behooves us to utilize this practically valuable knowledge, in the meantime, receiving with judicial minds and weighing carefully the arguments that scientists may, from time to time, present to us as to the cause.

The Duration of Human Life.



T is a matter of considerable interest with some practical applicability to inquire into the possible length of life vouchsafed to man. We say only *some* practical applicability because it is self-evident that in order that we should attain our greatest possible measure of longevity we must inherit physical perfection and live a life that is naturally perfect; conditions theoretically possible but practically unattainable.

The well-authenticated, if exceptional, instances in which men have lived for more than a century, must clearly and conclusively prove that such age is attainable, and the teaching of these actual facts is not disproved by the reasoning of physiological development.

Dr. Saffray, of Paris, whom we find quoted in *Good Health*, argues that

the greater number of mammals live nearly five times the length of time occupied in growth. The growth of man continues until his twentieth year, therefore the natural term of his life should be 100 years.

A German physician has collected and verified the following number of cases of longevity: From 100 to 110 years, 1000 cases; 110 to 120, 60 cases; 120 to 130, 29 cases; 130 to 140, 15 cases; 140 to 150, 6 cases; 169, 1 case.

Easton, an English writer, furnishes the following more complete list: From 100 to 110 years, 1310 cases; 110 to 120, 277 cases; 120 to 130, 84 cases; 130 to 140, 26 cases; 140 to 150, 7 cases; 150 to 160, 3 cases; 160 to 170, 2 cases; 170 to 185, 1 case.

Making allowance for some errors in these tables of extraordinary longevity, we see that every one has a right to hope to much exceed a century. Of course we know as well as any of our readers that the attainment of 100 years of life is likely to but few, but candidly we believe that this fact is due not to divine ordainment, placing the possible limit of life at a lesser age, but to our own deteriorated physical condition, as the result of centuries of wrong living, whereby we are deprived of the length of life originally possible to humanity.

Such longevity being possible, there is then in these days of sanitary enlightenment good reason for us all to hope, expect and strive to reach a greater age than that at which the majority of human beings now die.

We should not, as we now do, regard the attainment of a century of life as a curiosity of longevity, but should rather look upon it as a right to which we are all entitled and which is not an impossibility to any one.

We are all striving for wealth, though but few secure it; the impossibility of its acquisition never enters into our calculations; so also should we all strive for longevity; it is more universally possible than is the acquisition of wealth, and though we fall short of the possible 100 years, each effort made will tend so much towards the ultimate acquisition by man of that degree of longevity to which he seems to be physically entitled.

The Abolition of Immigration.



RIGHT heartily do we indorse the bill before Congress providing for the abolition of immigration for the period of one year, and right earnestly do we hope that it will promptly become a law.

Æsthetically, commercially, morally, hygienically—view the question as we may—the practically unrestricted immigration that has characterized the past history of this country is worthy only of condemnation for the future. We earnestly hope that the success of the great Chicago Fair will not be jeopardized by the entrance of the tramps of Europe into our country. We feel that we are but voicing the sentiments of all thinking persons when we earnestly urge upon Congress the prompt enactment of this greatly desirable legislation.

NOTES AND COMMENTS

The Sewerage of Knoxville.

Knoxville, Tenn., is building a system of sewers to cost \$250,000, which will be completed in eighteen months, and will employ five hundred men in the work.

The Jews and Cholera.

The Hebrew race is periodically reported to be exempt from the serious ills of humanity ranging from gonorrhoea to cancer. It is now asserted that the Russian Jews have been "miraculously" spared in the epidemic of cholera in Russia and at Hamburg. Unfortunately (says the *Med. Record*), the official statistics do not in the least bear this out.

Lye as a Disinfectant.

Ordinarily, domestic lye would seem, according to the *Revue d'hygiène*, to possess quite decided properties as a disinfectant. After an immersion of twelve hours in a solution of boiling lye, cholera and typhoid bacilli and charbon spores were invariably destroyed. Gerloczy, of Budah-Pesth, published a paper some years ago recommending lye as a microbe destroyer for fæcal matters; and recently Schimmelbusch and Behring have confirmed his results in experiments made with various micro-organisms.

Preventive Dentistry.

There are two prophecies current concerning the future of dentistry, writes Mr. Wm. Rushton, in the current number of the *British Journal of Dental Science*. One—the optimistic—predicts that in time preventive dentistry (as contrasted with conservative dentistry of to-day) will successfully oppose the many adversaries which now attack the teeth; the other prophecy—the pessimistic—maintains that man will become a recruit to the ranks of the order Edentata, and that future generations will not only be toothless, but hairless and spectacled. In other words, it is held that the dentistry of the future will be the adaptation of mechanical appliances to edentulous mouths. Mr. Rushton, however, thinks that the mean between these two extremes, comes nearest the truth, that the preventive treatment of the future will do much to arrest further deterioration of tooth tissue, but that teeth will never, in highly civilized communities, be brought back to the normal state as found in the skulls of our early forefathers. Much good, he is assured, may be done by more attention being given to the general health, by the teaching of cooking especially amongst the poorer classes, and by the aid of the dental surgeon, whose services are now not alone the privilege of the wealthy, but are fast becoming available for all.

A Death Sentence on Flies.

The police authorities of a town in Prussia are said to have issued a proclamation against flies. The decree states that, inasmuch as flies contribute to the spreading of cholera, citizens are commanded to exert themselves to the utmost to destroy all flies within their houses. The proprietors of beer saloons are ordered to keep fly-catchers on their counters. The penalty for not killing all the flies possible is a fine of \$7.50 for each offence, and continued neglect to destroy them will be punished by imprisonment.

Creating Panics.

While we have always held that the best policy is for health authorities to always make public the truth about epidemic or contagious diseases, we yet always decry the creation of panics, and we are glad to learn, from *Florida Health Notes*, that there is a law in Florida forbidding the dissemination of false rumors or statements concerning any infectious disease. Recently a resident of one of the ports of this State got it into his head that there had been several deaths from yellow fever on a vessel lying at the wharf, and he went about the town, the magnitude of the affair growing in his mind as he went, until he had, by his unfounded story, created the beginning of a veritable panic. Promptly the authorities issued a warrant and this dangerous individual was arrested and is now under \$500 bail to appear at the next term of Court.

Rules for Calling on the Sick.

Dr. Orland J. Brown, who writes to the *Healthy Home*, says that these rules are intended not to lessen neighborhood interest in the sick but to *correct bad methods* many well disposed callers have.

(1) Bear in mind that the inmates of every home where there is sickness are unusually busy, having extra duties and cares, and therefore less time to entertain callers.

(2) A call should never be undertaken unless you expect to make the recipient in some way feel the better for it.

(3) When leaving at the door your card, flowers, or a kind word, verbal or written, it is better you retire from the premises as soon as possible.

(4) Never ring the door bell or make any noise sufficiently loud to cause the patient to be aware of your presence, but make all necessary inquiries in the most quiet and unobtrusive manner.

(5) Never enter the sick room until you have the unqualified consent of the attending physician or nurse.

(6) Never remain longer than your best judgment with that of the attendant, agreed upon before entering, dictates.

(7) Do not speak of the malady or symptoms of the patient in his or her presence, if you can avoid it, but allude to the whole matter of the sickness in the most general way, expressing entire confidence and hope in as speedy a recovery as possible.

Contagious Sore Throat.

It can be conservatively said that it can do no harm and surely will do much good to regard every sore throat as possibly contagious. There is considerable uncertainty in medical minds as to this question of the contagiousness of sore throats, and every practicing physician has repeatedly had presented to him the spectacle of a severe throat affection, the only evident cause for which was the proximity of a case of generally regarded non-contagious sore throat. A French author has noted several cases of acute sore throat following in about eight days, the appearance in the waiting room of the "throat" department of a hospital, of a case of tonsillitis. There had been no previous cases for a long time. So that, to repeat, it will be wise for us not to regard any case of "sore throat," as above suspicion.

Small-Pox and Vaccination.

As our readers are probably aware, there is, particularly in England, a large anti-vaccination element, in which vigorous opposition is the rule. In addition to this, the fact that we have, now-a-days, so little small-pox, has brought about among many a sort of indifference towards, or neglect of, this undoubted means of prevention against small-pox. Hence does it seem necessary that we should every now and then stir the people up a little, lest this most beneficent operation of vaccination should fall into disuse. Now we learn that in the town of Leicester, in England (the inhabitants of which have for years vigorously resisted the law requiring the vaccination of children), an epidemic of small-pox has broken out, which bids fair to ravage the town. We must ever remember that every unvaccinated human being is not only a possible victim of small-pox, but is also a culture bed for the growth, multiplication and intensification of the germs of the disease.

The Water Supply of the Paris Suburbs.

The first case of cholera, cholérine, or cholera nostras which occurred in Paris this summer appeared in the Asylum of Nanterre. The water for this institution comes from Suresnes, on the Seine, a point at which the river has already received the contents of fifty-two sewers. A man, described as a confirmed drunkard, had just been admitted when he was taken ill and died, apparently from cholera. The authorities were not able, or in any case failed, to obtain any information as to his antecedents. Nanterre is a prison and also a sort of asylum for vagabonds. When the epidemic assumed a serious aspect, the number of inmates was reduced from about 4,000 to 3,000. Soon other cases occurred in the neighboring districts of Suresnes, Puteaux, and St. Denis. The Seine water from the Suresnes intake was found to contain, after filtration, 37,000 bacteria to the cubic centimetre, but the specific bacilli of cholera and of typhoid fever were not discovered. If the course of the Seine be followed to the water intake at Marly, which is close to St. Germain, it will be found that the river has received at this point the contents of 103 sewers, including the main drains and two-thirds of the Paris sewage.

Tobacco and Depopulation.

Thoughtful Frenchmen, it is well known, are coming to regard with some uneasiness the signs of stagnation, if not of actual decrease, in the population of their country, says the *Lancet*. Malthusian doctrines, however attractive in point of economy, do not now appear to exercise that fascination which once was theirs, and which we cannot doubt has much to do with the reduction of reproductive energy. We are reminded, however, by the author of a paper on this subject recently published, that other causes may have contributed somewhat to the same result. Under the heading of "Le Tabac et la Depopulation de la France," M. E. Decroix, who is the founder of a society intended to check the abuse of tobacco, assures us that, among such, a prominent place must be assigned to the influence of tobacco. The arguments by which he seeks to fortify this opinion are by no means void of ingenuity, and are supported by the evidence of investigations and information contributed by various medical men, and all of the vital statistics afforded by different departments of the country. Among the former there seems to be a consensus of opinion that tobacco consumed in excess exhibits in various degrees a constant sedative influence upon the reproductive system. A series of experiments by Dr. Depierras are quoted in order to show that the same rule holds good among the lower animals. In this case the offspring of cocks and male rabbits exposed to the fumes of tobacco are said to have proved feebler and shorter-lived than those born under natural conditions. The conclusions founded upon statistical testimony are very emphatic; more so, indeed, than we should consider to be justified by the accuracy of the method pursued in this inquiry. After comparing ten departments in which a greater, with ten others in which a less, amount of tobacco is consumed, M. Decroix, by summing up their collective disparities, has no difficulty in showing that in the former there is a marked excess of deaths, of stillbirths, of divorces, of illegitimacy, which he takes to be a mark of morbid vitality, and a falling off in the size of families. When, however, we compare the departments with each other separately, we frequently miss that evident connection between cause and effect which the author's views on tobacco would lead us to expect, and it is clear that we must in many cases allow for the action of other influences in producing the result for which it is blamed. Under the circumstances we cannot agree with all the propositions advanced in this paper. At the same time it cannot be denied that the excessive use of "the fragrant weed" is to be numbered among the forces opposed to a continuance of healthy life.

Even if the strong man does occasionally become jaded, he knows how to get back his strength and snap, and that a tired man is many removes from a tired-out one. There is a great deal in knowing whether your work is overdoing you or simply tiring you.

SPECIAL REPORTS

State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania.

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PLACE OF MEETING,
Supreme Court Room, State Capitol, Harrisburg, unless otherwise ordered.

TIME OF MEETING,
Second Thursday in May, July and November.

World's Columbian Exposition.

DEPARTMENT OF LIBERAL ARTS.

CIRCULAR No. 9.

THE BUREAU OF HYGIENE AND SANITATION.

THE Bureau of Hygiene and Sanitation of the World's Columbian Exposition has been organized to prepare a collective exhibit illustrative of the present condition of Sanitary Science. A detailed list of the subjects assigned to it will be found hereafter.

Starting from the standpoint that "the common health is the common wealth," and that hitherto sanitation and sanitary science have not received that amount of general public support which their importance demands, the Bureau will seek to set before the visitors to the Exposition such a representation of sanitary work and sanitary aids as will help to lift the general mind to a higher plane in its estimate of the work of sanitation. Not even the most exaggerative optimist would assert that the sanitary arrangements of our chief and best-cared-for cities are perfect, while it is well known that those of smaller towns and villages are of the most reprehensible type. On the other hand the pessimist cannot deny that the last two decades have seen very great and very marked improvements in the theory of hygiene as a science and in its practice as an art; the "vantage ground" thus gained it is to be hoped will be but a new base from which a more general and complete advance all along the line may be made. That eminent sanitary pioneer, Edwin Chadwick, dared to predict that the realization of municipal and domestic sanitary reforms would eventually result in the establishment of a death-rate of 5 to 7 per 1,000 in hygienic districts; thus every improvement of sanitary measures will be an aid to the fulfillment of Chadwick's vision. The often-quoted but never-to-be-forgotten results of sanitation in the city of Munich is an apt illustration of the benefits derivable. When that city was devoid of sewerage and pure water supply the death-rate from typhoid fever—pre-eminently a disease revelling in filth—was 24.20 per 10,000. The illustrious scientist, Pettenkofer, was consulted, and recommended the establishment of a system of sewerage and the introduction of a water supply from a new source. Upon the inauguration of the new systems the death-rate was reduced to 13.30 per 10,000; partial progress further reduced it to 9.26, and the completion of the cloacinae caused the rate finally to fall to 1.75 per 10,000, at which it has approximately remained.

While much in front of most other countries, the United States, with a death-rate to-day of 18 per 1,000, has an arduous advance to make, but it is confidently anticipated that among the many brilliant achievements of the World's Columbian Exposition that of advancing the work of sanitary reforms will not be the least.

The United States has been the pioneer and is still the leader in so many departments of the world's progress that it can scarcely be too enthusiastic to hope that she may rapidly forge to the front and assert her claim to be the leader in sanitation. Nowhere on the world's face are the enormous piles of masonry so numerous as they are in America, nowhere on the world's face ought the care of public life and health to be so great.

The aim of the Bureau of Hygiene and Sanitation will be to show as adequately as possible the position in which the theory and practice of hygiene stand at the present day, and it is hoped that the universities and colleges, the boards of health, State and municipal, the societies having hygiene and sanitation as their keynotes, the scientists, the physicians, the manufacturers and the public generally will cordially co-operate in the endeavor to make the exhibition worthy of the science and of our country.

Such varied sources will naturally produce varied results. Varied results shown in diverse ways will serve to heighten the general interest in the one theme. The theme has but one end in view, the improvement of the "common health."

The following is the general classification of the division :

HYGIENE.

Class 825.—Athletic training and exercise gymnasia; an active gymnasium will probably be arranged as an educational exhibit. Apparatus for gymnasia. Domestic apparatus for physical development and of gymnastic exercises and amusement. Special apparatus for training in schools. Gymnasia. Appliances illustrative of school drill.

Class 826.—Alimentation.—Maps and diagrams of geographical distribution of foods. Models of foods in proper and improper conditions for human consumption. Equivalents and constituents of foods. Samples, diagrams (and, or) models showing physical and economic values of each kind of food in general use. Illustrations by models and pictures of foreign and little-known foods and the modes of manufacture by the natives. Adulterations of food. Specimens of adulterated foods, articles used as adulterants and diagrams of alimentary and economic loss caused thereby. Detection of adulterations and apparatus used in analysis. Models of abattoirs. Special apparatus and appliances used in the preparation of food, cooking and serving other than those contained in Group 115. School kitchens and arrangements for school canteens. Methods of warming children's meals. Apparatus and appliances for keeping food warm after having been cooked. Dinner pails and receptacles for carrying meals for school children, working men and others. Models (and, or) diagrams of restaurants, dining halls, refectories, etc. Economical cookery. Working men's and other kitchens. Apparatus and processes for conserving, storing and conveying fresh foods of all kinds. Appliances used for preparation of foods. Diseases due to unwholesome and improper foods. Drawings and models of animal and vegetable parasites. Practical dietaries: army, navy, prison and general.

Class 827.—Dwellings, etc.—Buildings or large models of buildings showing: Defects and unsanitary conditions, as frequently found in houses. Proper modes of building, draining, ventilating and warming houses on sanitary principles. Farm house of sanitary but economic construction. School house of sanitary but economic construction. Models (and, or) designs of buildings of all kinds in reference to their sanitary qualities, and characterized by the conditions best adapted to health and comfort, including dwellings for working men and factory operatives, in connection with large manufacturing establishments, tenement houses, "flats" and suites of apartments, city and country residences, club houses, school houses, improved buildings for elementary schools, infant schools, court rooms, theatres, churches, etc.

Class 828.—Hotels, Lodging Houses, etc.

Class 829.—Public Baths and Lavatories.—Public urinals and closets. Manufacturers' exhibits of sanitary appliances and methods for dwelling houses, buildings and cities. Apparatus for heating, lighting and ventilating buildings in their relation to health. Air inlets and outlets. Cows, etc. Models and designs for drains and sewers. Apparatus and appliances used in connection with domestic sanitation, except those classified in Group 120.

Night soil apparatus, carts and other appliances for the removal of night soil and refuse. Methods of disposal of sewage and refuse. Earth and ash closets. Commodes and utilization of sewage; manufacture of poudrette and other fertilizing materials. Baths, washing apparatus, detergents, etc., except those classified in Group 120. Refuse crematories. Non-poisonous paints and wall-papers, floor coverings, washables, decorations, etc. Exhibit showing various modes of disposal of the dead in the past and present. Cremation and desiccation. Models and designs of aqueducts. Plans of waterworks, artesian wells, pumping stations, modes of distribution (ancient and modern). Apparatus for cleansing mains, etc. Models and designs of reservoirs, filtering beds and associated subjects. Public drinking fountains; drinking fountains and troughs for animals, especially in reference to prevention of rabies in dogs. Filters and other methods of purifying water. Apparatus for chemical and biological examination of water. Diagrams, etc., of results. Analytical laboratory work. Illustrations by models and drawings of diseases produced by and conveyed through the impurities of water. Charts showing the mortality caused by diseases generally referable to impurity of water supply. Laboratory arranger for bacteriological investigation, in which will be illustrated the modes of preparation of cultivating media; modes of cultivation of germs, disinfection, etc. Diagrams and illustrations in various forms of bacteria, etc. Apparatus intended for the prevention of infectious diseases. Methods, materials and instruments for destroying germs. Disinfectors and disinfecting apparatus for material, houses, etc. Disinfectants and deodorants. Apparatus and fittings for warming, ventilating and lighting schools; school latrines, closets, etc. Special school fittings for storing and drying clothing. Precautions in schools for preventing the spread of infectious diseases; school sanitarium, infirmaries, etc. Hygienic clothing: models, designs and charts, illustrating the comparative value of dress materials for articles of clothing in reference to their hygroscopic and thermic qualities. Unflammable clothing. Sanitary underclothing. Dresses for bicycling, mountaineering, swimming and athletics. Dresses for factories, for nurses, etc. Life-saving dresses. Firemen's dresses. Illustrations of deformities produced by dress, boots, tight lacing. Poisonous and non-poisonous dyes used in the manufacture of clothing. Illustrations of diseases produced by poisonous dyes. Charts showing the mortality caused by infectious diseases in children.

Class 830—Hygiene of the Workshop and Factory.—Models and designs of workshops and factories. Models and designs of improvements in the arrangement and construction of workshops, especially those in which dangerous or unwholesome processes are conducted. Apparatus and fittings for preventing or minimizing the danger to health or life from carrying on certain trades. Guards, screens, air-jets, preservative solutions, washes. Protective objects for personal use: mouthpieces, spectacles, hoods, etc., for the use in certain unhealthy and poisonous trades. Ventilation of workshops: by simple discharge of internal air; by destroying offensive or injurious quality of discharged air. Removal of effluvium nuisances: by condensing and utilizing vapor; by consuming vapor; by other means. Removal of dust nuisances in certain trades. Prevention of danger from infectious diseases that may arise in wool-sorting, rag-picking, etc. Prevention of accidents in workshops, factories, mines and elsewhere. Other inventions or improvements for ameliorating the condition of life of those engaged in unhealthy occupations. Means for economizing human labor in various industrial occupations. Illustrations of diseases and deformities caused by unwholesome trades and professions; methods of combating these diseases; preservative measures, etc. Meteorology in connection with hygiene. Diagrams, models and apparatus illustrative of the climatal conditions prevailing in various parts of the world; the climatal relations between health and disease; rainfall, percolation and flow from the ground, etc. Illustrations and charts relative to the beneficial effect of certain climates upon certain diseases.

Class 833—Protective Supervision.—Sanitary supervision; vaccination and its enforcement; isolation of infectious diseases; quarantine; prevention and elimination of animal epidemics. Models and designs of quarantine establishments; quarantine ships; disinfecting vessels, etc. Models, charts and diagrams, showing the work of the various State Boards of Health in the prevention of mortality and sickness from infectious preventable diseases;

results of isolation and disinfection in comparison with lack of either or both. Food Inspection: treatment of adulterated foods; food inspection; special milk inspection; treatment of stale food substances; regulation of abattoirs, mills, etc. Regulation of sale of horses and cattle; protective devices, etc. Building Inspection: building regulations and inspection. Fire regulations. Charts of fire statistics. Personal Inspection: color, tests, etc.; professional examination for licenses, etc. Immigration: reception, care and protection of immigrants. Control of immigration in so far as sanitation is concerned. Formation of a library of reference to consist of Home and Foreign National Reports on Hygiene, Sanitation and kindred subjects. Reports of State Boards of Health, City Boards of Health and Sanitary and Hygienic Associations throughout the world. Publishers' books on Hygiene, Sanitation and cognate subjects.

The Bureau will arrange, as far as possible, for the presentation by exhibitors of models of sanitarily built and equipped dwelling-houses, urban and rural; farm-houses; school-houses; public lavatories, closets and urinals; crematories for the dead; crematories for garbage, etc. If any of those subjects should be left unrepresented by exhibitors, the Bureau will endeavor to supply the deficiency by placing adequate illustrations in the shape of models and designs before the visitors to the Exposition.

It will also exhibit scientifically arranged laboratories from the prosecution of bacteriological research, and of hygienic analytical investigations.

It will seek to supplement the valuable labors of the Boards of Health and of Sanitary Societies by codifying and collectively tabulating the results of their work.

Food and food adulterations will receive special attention, and it is desired that a complete illustration of those important subjects may be obtained.

The great problems of potable water supply, drainage and sewerage, ventilation and heating will all be duly cared for, and it is hoped that municipalities, companies and associations, as well as individual exhibitors engaged in those departments of sanitation, will aid in the efficacy and interest of the division by displaying models and illustrations of their work.

STATE BOARDS OF HEALTH.

The State Boards of Health are asked to prepare the following :

Charts showing the mortality statistics of their State.

Charts showing the morbidity statistics of infectious diseases.

Charts showing the effect of isolation and disinfection in prevention or minimization of disease, and other charts, diagrams, models, etc., that may be deemed desirable.

ASSOCIATIONS AND SOCIETIES.

Associations and Societies engaged in sanitary work of any kind are solicited to have their aims and results represented by models, illustrations, charts, etc. During the last decade much improvement has been wrought in the welfare of the denizens of our crowded cities by the labors of many philanthropic bodies, and the women of this and other countries have, as usual, been amongst the foremost to appreciate the value of sanitary measures and to stimulate their enforcement by the various authorities. It is anticipated that this portion of the division will not be, by any means, the least interesting and instructive.

MAPS AND CHARTS.

It will be the most desirable, for the convenience of hanging them without loss of much required space, that all maps, charts and diagrams exhibited by State Boards of Health, and Associations and Societies, shall all be of uniform dimensions. It is suggested that all State maps shall be drawn on the scale of four miles to the inch, excepting those States the area of which is very large; for those it will be desirable to reduce the scale, whereas for the small, but more densely populated States, a more liberal scale may be chosen. The map should show the more important natural features, coasts, mountains, rivers and the railways and larger towns. The counties may be shown by shaded outlines.

It is recommended that charts and diagrams be prepared of a uniform size on cardboard sheets of twenty-two by twenty-eight inches, so that they be readily inserted into frames which should measure twenty-four by thirty inches. The frames are glazed on both sides so as to allow two charts to be exposed to view in each frame.

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The above suggestions are recommendatory only, but it will be obvious that similarity of size will simplify considerably both the labor of installation, and the convenience for reference.

It is further recommended that the graphic mode of representing percentages be adopted; but it would be advantageous to attach to the graphic form the actual figures of the percentages.

LIBRARY.

The Bureau desires to form a library which shall represent as fully as possible all the phases of hygiene and sanitation.

To accomplish this object all the State Boards of Health and their auxiliary local boards of health are asked to contribute copies of all their reports and other publications bound in suitable substantial binding, and lettered on the back with the name of the State (in the case of an auxiliary board, with also the name of the city or other district) and the date of the report. Publications other than reports should be lettered "Publications years to....."

Forms, notices or circulars used in the work of the Board should be bound in a separate volume, to be lettered "Forms, etc."

Sanitary Associations and Societies are asked to contribute their reports and publications bound in a similar manner.

Authors and publishers also are asked to send a copy of such works as they have published on hygiene, sanitation and cognate subjects. The books should all be lettered on the back with the title, name of author, name of publisher, date of publication and publication price.

FOREIGN COUNTRIES.

The suggestions and invitations made in this bulletin are intended to be also fully applicable to all other countries; therefore the Commissioners representing the Governments, and the representatives of sanitary science in all nations are cordially asked to accord to the division their valued co-operation.

Inasmuch as it is expected that no individual exhibitor in this Bureau will require an entire standard, and as the standards can be more economically manufactured in large quantities, it is proposed that they shall be manufactured by this Bureau, and the cost assessed on each exhibitor in proportion to the number of frames used. The expense will be about \$3 for each frame, which includes two exhibition surfaces, *i.e.*, one on each side of the frame. All other expense of installing exhibits will be borne by the Columbian Exposition.

APPLICATIONS FOR SPACE.

It will be necessary for each exhibitor to make formal application for space to the Director General, and it is requested that these applications be made as early as possible, in order that the Department of Liberal Arts may be able to prepare an estimate of the amount of room that will be required. On addressing the Department of Liberal Arts at Chicago, a blank form of application will be sent to exhibitors without delay.

In all cases where foreign countries have appointed Commissioners for the Columbian Exposition, applications for space for exhibits from those countries must be made through such Commissioners.

☞ The Superintendent of the Bureau of Hygiene and Sanitation invites from experts in any of the branches of the science any suggestions or recommendations that will aid in making the exhibit of the division complete and serviceable.

F. W. BREWER,

Superintendent Bureau of Hygiene and Sanitation.

Approved: SELIM H. PEABODY,

Chief, Department Liberal Arts.

Approved: GEORGE R. DAVIS,

Director-General.

Special Meetings of the State Board of Health of Pennsylvania.

SPECIAL MEETING, SEPTEMBER 3, 1892.

A Special Meeting of the State Board of Health was held at the Executive Office, Philadelphia, on Saturday, September 3d, 1892, at 2 P.M. Present: Dr. Pemberton Dudley, Dr. J. F. Edwards, Dr. Geo. G. Groff, Mr. Howard Murphy, C. E., and Dr. Benjamin Lee, Secretary.

In the unavoidable absence of Dr. Samuel T. Davis, President, who was in Idaho, Dr. Pemberton Dudley moved, and Dr. Benjamin Lee seconded, that Mr. Howard Murphy, C. E., take the chair. The motion was carried. The Secretary read a communication from Dr. J. H. McClelland, stating that at the last moment he was prevented from attending.

The Secretary stated that the meeting had been called to hear his report as Secretary and Executive Officer, of the measures already taken by him to aid in preventing the admission of Asiatic cholera into the United States, and to take such further measures as might be deemed necessary in view of the rapidly increasing gravity of the situation.

On the 21st day of May last, in anticipation of the arrival of cholera on our shores from Europe, Dr. Lee had sent copies of Circular No. 7, revised, on "Precautions against Cholera and other Choleraic Affections," to 300 prominent daily papers throughout the State. He had taken this means of reaching both health authorities and the public generally, conceiving it to be the most effective, and had reason to believe the information thus conveyed was widely disseminated.

On the 7th day of July, he had visited the quarantine station of Boston, and on the 9th day of July, that of New York, and conferred with the authorities of those stations as to the means to be adopted to place them in the highest state of efficiency.

Immediately on receiving intelligence of the prevalence of cholera in Hamburg, doubting the capacity of the station at Lazaretto, to care for any large number of suspects and patients, he had written to Dr. William H. Ford, President of the Board of Health of Philadelphia, and Major Moses Veale, Health Officer, advising that all vessels from European ports be detained at the United States Marine Hospital Service Quarantine Station, Delaware Breakwater, for examination.

On the 26th of August he telegraphed Dr. Walter Wyman, Supervising Surgeon General, of the United States Marine Hospital Service, as follows:—

"The State Board of Health of Pennsylvania considers that you would be justified in including arrivals from all European ports in your order of the 18th instant."

This action was taken in compliance with a request from the Secretary of the State Board of Health of Illinois. On the 29th of August a request was received from the same officer that the Board should coöperate with their own in memorializing the President to issue a proclamation suspending immigration until the cholera should subside. This he hesitated to do for two reasons: First, because he doubted the legal power of the President to take this step; secondly, because he felt that any such recommendation should take the regular course through the Marine Hospital Service, to which the duty of enforcing quarantine is assigned by law.

The following telegram was therefore sent:

"Dr. Walter Wyman, Supervising Surgeon General, of the United States Marine Hospital Service, Washington, D. C.

"In view of the cholera situation, the State Board of Health of Pennsylvania respectfully suggests that absolute prohibition of immigration from Europe during the present epidemic be enforced. If your department does not possess the power, this Board will second you in petitioning the President to do so, and if necessary, to call Congress in extra session to authorize such action.

BENJAMIN LEE, Secretary."

To this the following reply was received:

"WASHINGTON, D. C., Sept. 1, 1892.

"DR. BENJAMIN LEE, *Secretary of State Board of Health of Pennsylvania.*

"Circular issued to-day. Have State Board of Health to declare twenty days' quarantine on all immigrant vessels. See circular in press dispatches.

"(Signed) WYMAN, Surgeon-General."

The Secretary had recently had a personal interview with the Secretary of the State Board of Health of New York, who had issued stringent instructions to city and township health officers on the northern border of that State to use the utmost vigilance in preventing the disease from entering the country from Canada, should it unfortunately obtain a foothold in that country. He had promised to keep the Pennsylvania State Board of Health informed of all suspicious cases that may occur, and of all action taken by him.

A Special Circular "To all Health Officers, Boards of Health and Borough Councils in the Commonwealth of Pennsylvania" was now in the hands of the State Printer, having been sent to him on the 24th of August, with orders to print 10,000. This circular urged these authorities, in the strongest possible terms, to supplement the vigilance of the Quarantine officials by placing their towns in such a condition of cleanliness that should a few stray cases of cholera pass the coast cordons its germs would find no congenial nests in which to develop. It further advised the passing of stringent regulations or ordinances in regard to cesspools, drains, pig-styes, slaughter-houses, gutters and other similar nuisances, especially urging that all public supplies of drinking water should be carefully investigated. With this circular it was proposed to issue copies of the Cholera Circular, the Model Ordinance and the Sanitary Survey blanks prepared by Dr. Geo. G. Groff.

On motion of Dr. Groff, seconded by Dr. Dudley, it was resolved that the action of the Secretary with reference to the exclusion of cholera be and is hereby heartily approved and endorsed.

On motion of the same gentlemen it was resolved, that, pending the arrival of the special circular from the State Printer, copies of this regulation be sent to the principal newspapers throughout the State.

The Secretary then submitted the following order :

"In accordance with the proclamation of the President of the United States, and in compliance with the request of the Surgeon-General of the United States Marine Hospital Service in charge of the National System of Quarantine, the State Board of Health of Pennsylvania hereby orders that in view of the fact that Asiatic cholera prevails in many ports and States of Europe, including Great Britain, no vessel from any cholera-infected port shall be permitted to enter at any port in this State until such vessel shall have undergone a quarantine detention of twenty days.

"It is further ordered that no vessel as hereinbefore described shall be permitted to enter the waters of the Delaware River above the line dividing the State of Pennsylvania from the State of Delaware, without having been previously inspected by the officer in charge of the United States Marine Hospital Station near the town of Lewes, in the State of Delaware, it being understood that such order is co-operative with and not in contravention of the orders of the Board of Health of the city of Philadelphia.

It is further ordered that no boat, tug, skiff or any other conveyance shall be permitted to land on the shores of any rivers or lake or at any wharf or dock on the same from any such vessel, or to go from said shores to any such vessel, save and except those which are employed or authorized by legally constituted quarantine authorities.

All police officers and constables in townships bordering on waters into which such vessels may come are hereby enjoined to keep vigilant watch to prevent any such intercommunication."

This order shall take effect at once.

By order of the Board.

BENJAMIN LEE, M.D., Secretary and Executive Officer.

The order having been read, Dr. George G. Groff moved and Dr. J. F. Edwards seconded that the order as read by the Secretary be adopted and approved.

The motion was carried.

On motion of the same gentleman, the Secretary was instructed to have copies of this regulation printed and sent to every member of the Board, and it was further resolved that the order, together with all the proceedings of this meeting, be given for publication to the press.

The Secretary then read a copy of a regulation for transportation companies, as follows:

TO TRANSPORTATION COMPANIES.

In accordance with regulation III of this Board, which reads as follows :

“ Regulation in regard to the Sanitary Supervision of Travel and Traffic.

“ Upon satisfactory information of the approach to or the transit through the Commonwealth of Pennsylvania of infected persons or goods, it shall be the duty of the Secretary, as executive officer of the Board, to cause the same to be stopped at the State line, or, if found within the limits of the State, to cause such persons or goods to be removed from cars, stages, vessels, boats, or other conveyances, and securely isolated and disinfected; and he may, if in his judgment the emergency is such as to demand it, call a meeting of the Committee on Travel and Traffic, to which his action shall be submitted, with his reasons therefor, in writing. But, in cases coming under the jurisdiction of national or municipal quarantine authorities, he shall co-operate with said authorities in all such action ” :—

Notice is hereby given to the officers of all transportation companies, whether by land or by water, that any transportation company shall be declared contraband of quarantine which shall introduce, land or transport within the borders of this Commonwealth of Pennsylvania any person suffering from Asiatic cholera or cholera (so-called), or any person who shall develop said disease within four full days after having been so introduced, transported or landed within the borders of said Commonwealth by such company.

If a railroad company be thus declared contraband of quarantine its trains shall be stopped at the State line, and held until inspected by an inspector of this Board and declared by him free from the danger of conveying the contagion of Asiatic cholera into this Commonwealth.

If a steamboat, canal, or other navigation company, its boats shall not be allowed to enter any dock, tie up at any wharf, or by any means land passengers, baggage or merchandise until it has undergone like inspection and been declared free from danger of introducing the said contagion into the Commonwealth of Pennsylvania.

By order of the Board.

BENJAMIN LEE, M.D., Secretary and Executive Officer.

On motion of Dr. George G. Groff, seconded by Dr. J. F. Edwards, the regulation as read was approved and adopted.

The Secretary then submitted the following circular of instructions :

TO THE OFFICERS OF RAILROAD AND STEAMBOAT COMPANIES IN PENNSYLVANIA.

The principal railroad companies operating in this State have adopted admirable regulations for the sanitary care of their cars and premises under ordinary conditions. The State Board of Health has already taken occasion to commend these, as well as the readiness of these companies to co-operate with it in efforts to protect the public health. In view, however, of the threatened invasion of Asiatic cholera it is important to enforce these regulations with unusual strictness and to take certain additional precautions.

The Board therefore orders :

First.—That all water-closets and urinals in cars be provided with proper water-tight receptacles for retaining deposits instead of allowing them to fall on the tracks and thus endanger water supplies; said receptacles to contain disinfectants, and to be renewed at certain intervals in such places and in such a manner as may be determined upon for the most perfect protection against infection. The adoption of the precaution should be begun with second-class and immigrant cars, and extended as rapidly as possible to first-class cars.

Second.—Should the discharges of the sick fall upon seats, floors or platforms of cars or stations, they should be first disinfected, and then removed in closed buckets, and the soiled places then disinfected and thoroughly cleaned.

Third.—All cars coming from infected places shall be disinfected before sweeping, and the sweepings disinfected and burned.

Fourth.—All water-closets and urinals in steamboats and canal boats shall be provided

with proper water-tight receptacles for retaining deposits instead of allowing them to fall into the water, which is in most instances the supply of drinking water for some centre of population. Such receptacles shall always contain disinfectants, and shall be emptied at the end of each trip in such manner and in such place as may be designated by the local authorities.

Fifth.—All accumulations of filthy clothing, and rags shall be at once disinfected and burned.

Sixth.—Should cholera become epidemic the drinking water furnished for the use of passengers should be boiled, and so far as possible should not be obtained from places in which the disease exists.

By order of the Board,

BENJAMIN LEE, M.D.,
Secretary and Executive Officer.

On motion of Dr. George G. Groff, seconded by Dr. J. F. Edwards, the order as read was adopted and approved.

Dr. P. Dudley moved, and Dr. Benjamin Lee seconded, That the Medical Inspectors of the State Board of Health be instructed to note, as opportunity offers, what action is being taken by municipal authorities and railroad and steamboat companies, in conformity with the orders and instructions of the Board, and to report the same to the Secretary.

The motion was carried.

On motion of Dr. P. Dudley, seconded by Dr. Benjamin Lee, it was

Resolved, That the attention of the National government be drawn to the fact that a deliberate plan has been formed for the introduction into the United States, through Canada, of immigrants now under the ban of the President's proclamation.

Dr. George G. Groff moved, and Dr. J. F. Edwards seconded, That the Secretary be instructed to appoint deputy medical inspectors at such points as circumstances may, in his judgment, render necessary.

The motion was carried.

Dr. Benjamin Lee moved, and Dr. J. F. Edwards seconded, and it was

Resolved, That the Secretary be instructed to represent to His Excellency the Governor of the State, the danger now threatening our population from cholera, the inability of the Board to appoint paid agents who may be necessary for purposes of railroad inspection and other precautionary measures, and to inquire of him whether any portion of the moneys in the State treasury can be drawn upon to meet these exigencies.

Dr. George G. Groff moved, and Dr. J. F. Edwards seconded, that the Secretary be instructed, on the appearance of cholera in any portion of the State, without sanitary authorities, to confer with the county authorities in regard to the furnishing of hospital accommodation and medical and nursing care, and to make application to the Adjutant General of the State for a sufficient number of tents for hospital purposes.

The motion was carried.

The same gentlemen moved that the Board advise that all drivers and attendants of ambulances, and all other persons coming in contact with cholera patients, and compelled to pass through the public streets, should wear oil cloth or rubber coats and overalls.

The motion was carried.

On motion of Dr. George G. Groff, seconded by Dr. Benjamin Lee, it was

Resolved, That the United States authorities be requested to provide accommodation on shore for all passengers and crews whose vessels are detained in quarantine at the Delaware Breakwater.

The Board then adjourned.

(Signed) BENJAMIN LEE, *Secretary.*

SPECIAL MEETING, SEPTEMBER 16, 1892.

A Special Meeting of the State Board of Health was held at the Executive Office, Philadelphia, on Friday, September 16, 1892, at 2.15 P.M. Present: Howard Murphy, C. E. Pemberton Dudley, M.D., J. F. Edwards, M.D., and Benjamin Lee, M.D., Secretary.

In the absence of the President, Mr. Howard Murphy, C. E., was on motion called to the chair.

PRECAUTIONS IN REGARD TO TRANSPORTATION OF CHOLERA.

The Secretary stated that this meeting was held at the call of Dr. Pemberton Dudley and Dr. J. F. Edwards, and the Secretary in view of a contemplated conference of the Committee on Preventable Diseases, Disinfection, and Sanitary Supervision of Travel and Traffic, with the Managers of the principal railroad companies operating in Pennsylvania, to consider the most practical and efficient means for carrying out the instructions of the Board with regard to preventing the transportation of cholera into the State.

POINTS OF ENTRY OF RAILROADS.

The Secretary read a list of all points of entry of railroads carrying passengers into Pennsylvania. He further pointed out the most important of these points of entry at which roads carrying immigrants enter the State, and suggested that the necessity might arise for examining passengers on trains at all such dangerous points.

REPORT OF CONFERENCE AT PITTSBURGH.

He reported that at a Conference recently held at Pittsburgh between himself, the Secretaries of the State Boards of Health of Ohio and West Virginia, and the Mayor and other prominent officials of Pittsburgh, a resolution had been passed that the Governor of this State be requested to at once raise the sum of \$50,000 to be placed at the disposal of the State Board of Health to meet the existing emergency. He pointed out that the proposed Medical Inspectors at such points of entry would require prompt payment, and that numerous other expenses would be incurred, which indicated the necessity for the Board being provided with funds without unnecessary delay. He suggested that Dr. J. F. Edwards, Chairman of the Committee on Preventable Diseases, Disinfection and Sanitary Supervision of Travel and Traffic was the appropriate member of the Board to assume general supervision of this whole matter of inspection of passengers.

RESOLUTION TO CALL A PUBLIC MEETING OF CITIZENS.

Dr. J. F. Edwards moved and Dr. Pemberton Dudley seconded that the Board respectfully request His Honor the Mayor of Philadelphia to call a meeting of leading citizens for consultation with the State Board of Health in order to devise means for raising funds to meet the emergency which now confronts the Board in view of the threatening invasion of cholera, and to enable said Board to repel the same.

The motion was carried.

The Board then took a recess to enable the Committee on Preventable Diseases, Disinfection and Sanitary Supervision of Travel and Traffic to hold its proposed conference with the officers of railroad companies.

Upon reconvening, the Secretary pointed out that the result of the conference just concluded showed the magnitude of the work before the Board.

On motion of Dr. Pemberton Dudley, seconded by Dr. J. F. Edwards, it was

Resolved, That the question of the time of the public meeting with His Honor the Mayor be left in the hands of the Secretary. On motion of Dr. J. F. Edwards, seconded by Dr. Pemberton Dudley, the Board then adjourned to meet at the call of the Secretary.

(Signed) BENJAMIN LEE, *Secretary*.

SPECIAL MEETING, SEPTEMBER 21, 1892.

A Special Meeting of the State Board of Health was held at the Colonnade Hotel, Philadelphia, on Wednesday, September 21, 1892, at 2.15 P. M.

Present, Hon. Samuel T. Davis, M.D., President, in the chair. Mr. Howard Murphy, C. E., Pemberton Dudley, M.D., J. F. Edwards, M.D., and Benjamin Lee, M.D., Secretary.

A telegram was read by the Secretary from Dr. James H. McClelland, of Pittsburgh, regretting that he was unable to be present. A letter to the same effect was also read from Dr. George G. Goff, of Lewisburg.

On motion of Mr. Howard Murphy, C. E., seconded by Pemberton Dudley, M.D., it was *Resolved*, That the Secretary be instructed to telegraph to the Governor, asking at what time it will be convenient for him to meet the Board, as a result of a conference with the Citizens' Relief Committee of Philadelphia.

On motion of Mr. Howard Murphy, C. E., seconded by Pemberton Dudley, M.D., it was further

Resolved, That the Committee on Water Supply, Drainage, Sewerage, Topography and Mines be authorized to arrange for a conference between the health and municipal authorities of all towns within the drainage area of the river Schuylkill and this Board at as early a date as possible.

(Signed) BENJAMIN LEE, *Secretary*.

SPECIAL MEETING, SEPTEMBER 22, 1892.

A Special Meeting of the State Board of Health was held at the Lafayette Hotel, Philadelphia, September 22d, 1892, at 3.30 P.M.

Present: Hon. Samuel T. Davis, M.D., in the chair, Dr. Pemberton Dudley, Dr. J. F. Edwards, Mr. Howard Murphy, C. E., and Dr. Benjamin Lee, Secretary.

The Secretary stated that this was a Special Meeting of the Board, called in pursuance of the resolution passed at the meeting held the previous day (September 21, 1892), requesting His Excellency, the Governor of the State, to appoint a time and place at which the Board could meet him in conference regarding the question of providing funds to meet the emergency created by the presence of cholera in a neighboring city. Such conference having taken place, it was for the Board to decide what action should be taken.

The Secretary read a telegram from Dr. J. H. McClelland, asking for instructions as to the money offered to the Board.

NO LAW TO ACCEPT ADVANCES OF MONEY.

On motion of Dr. Pemberton Dudley, seconded by Dr. J. F. Edwards, it was

Resolved:—That the Secretary be instructed to reply to the generous offer of the Carnegie Steel Company to advance the sum of \$20,000, to aid the Board in taking measures to prevent the introduction of cholera into this State, that the Board finds itself without authority under the law to accept any advances of money, except through the Executive of the State.

On motion of Mr. Howard Murphy, C. E., seconded by Dr. Pemberton Dudley, it was

Resolved:—That the Secretary be instructed to ask the different railroad companies throughout the State, to whom circulars were sent, instructing them to disinfect their cars and carefully inspect their lines, cars and stations, for a detailed report as to whether these instructions have been complied with.

Mr. Howard Murphy, C. E., offered the following resolution, which Dr. J. F. Edwards seconded:—

Whereas, The Board considers the danger of an epidemic of Asiatic Cholera in the State of Pennsylvania next year imminent, and that immediate measures should be taken to prepare for the protection of the people by arranging for proper sanitary supervision of travel and traffic, patrol of the State, and examination of the drainage systems and water supplies of the Commonwealth,

Resolved:—That His Excellency, the Governor of the Commonwealth, be respectfully requested to place \$50,000 at the present disposal of the Board.

Mr. Howard Murphy, C. E., voted in the affirmative, Dr. Samuel T. Davis, and Dr. Benjamin Lee in the negative, Dr. J. F. Edwards not voting and Dr. Dudley having previously retired.

The resolution therefore failed to pass.

The Board then adjourned.

(Signed) BENJAMIN LEE, *Secretary*.

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PHILADELPHIA, FEBRUARY 1, 1893.

No. 2.

COMMUNICATIONS.

The Progress of Sanitation in New Jersey.¹

BY E. L. B. GODFREY, A.M., M.D.,
Of Camden, New Jersey.



We have assembled again in this, the Eighteenth Annual Meeting of the New Jersey Sanitary Association, to discuss the vital questions belonging to sanitation. The subject is one of deep importance to the Association and to the State, for it means no less than the proper care of the public health.

Sanitation is one of the important questions for Government consideration. Next to the moral welfare of a community lies its physical well-being, which constitutes, in a large measure, the basis of its prosperity. In the health of every subject the State is interested, and in the relationship existing between individuals it has the right to guard the interests of the community. The State should look to the preservation of the lives of its people from preventable causes of disease and death. And since the welfare of one State depends in a large measure upon that of every other State, in its health as well as in its political and commercial relations, it is imperative that there should be uniform health laws, especially in relation to quarantine. These laws should be supreme throughout the country, and should apply in all emergencies, and to all causes of domestic and foreign pestilence. The yellow fever epidemic of 1886, and the late cholera endemic in

¹ Annual Address before the New Jersey Sanitary Association.

New York Harbor, show the necessity of this. In addition, the State, as the ultimate source of power, and on account of its vast resources, should collect, record and analyze vital statistics, arrange the facts relating to human life under different circumstances, determine their effects, and distribute, for the welfare of its subjects, the information upon which the science of preventive medicine can be best erected. To execute the health laws of the general Government, to collect and classify vital statistics, to publish and distribute the facts essential to sanitary progress, there should be, as has been suggested by the American Medical Association, a cabinet officer known as Secretary of Public Health.

SANITARY PROGRESS IN EUROPE AND AMERICA.

But before passing to the record of sanitary progress in New Jersey, the subject about which I propose to speak to-night, take with me a glimpse of its course in European countries and America. Sanitary progress has been of slow growth at home and abroad. The fearful plagues of Mediæval English and Continental history seem to have been met in a spirit of fatalism, and to have literally devoured their way through Europe until nothing remained for them to feed upon. Medical skill, in those days, was unable to cope with the overwhelming odds of universal ignorance and disregard of the simplest laws of sanitation. But here and there arose bright lights which dispelled the dense clouds of stupidity and superstitious fears. Like living sentinels, there stand forth the names of prominent physicians who risked, in the cause of public health, their reputation and often their lives.

In 1854, the fearful death-rate resulting from the unsanitary condition of the English army in the Crimean War, shocked the civilized world, and aroused England to the necessity of sweeping reforms, effected largely through the exertions of Florence Nightingale, which reduced the mortality in the hospitals of the Crimea from sixty per cent. to a little above two per cent. Rarely, indeed, have the principles of sanitary science been better illustrated. It was not, however, until 1875, that England codified under one law all previous sanitary legislation, and established the local Government board as a central authority in matters of public health. The recognition of the germ theory of disease marked a new epoch in sanitary methods. The sanitary laws of England are now of a high character and, in some respects, models for us.

The late cholera epidemic tested the power of the London health officials to prevent the introduction of the pest into one of the worst hot-beds of disease in the world, the east end of London, and with successful results.

Owing to her changing political history, and to her lack of educational facilities among the lower classes, France has, perhaps, made less rapid progress in sanitation than England. Her advance during the past century is marked, and the present health laws are better than in some of her neighboring countries. Councils of public health are organized throughout France, and act in conjunction with the police. It is only too plain, however, that the municipal authorities of Paris and Havre were unable to deal with the recent cholera invasion as promptly and decisively as the occasion demanded.

In Germany, the health regulations are matters of interest to the Kaiser who, by reason of his military authority, should be able to enforce existing laws. Scientific interest is shown in the etiology and prevention of disease, and the names of Koch, Virchow and others are highly revered by the educated classes of the Empire.

But all Continental nations have to fight against the ancient and faulty construction of the older cities and the superstitious ignorance of the lower classes. It is difficult to teach the necessity of isolation and disinfection, and the risk of contamination from commercial traffic. The recent terrible mortality from cholera at Hamburg, the high death-rate at Paris, and the panic in Berlin, were mainly due to the fact that these cities, built on sluggish rivers and permeated with canals, contain a large population, living on the edge of these colossal drains, or in barges floating on their surface, who persist in drinking and using the river water, saturated with infection.

Fortunately for America, and especially for the United States, many of the complex hindrances to thorough sanitation which exist in Europe, because of its ancient civilization and mediæval traditions, are wanting here. Our faults are those of youth and inexperience; our space is more ample; our population less dense and better educated; our material and financial resources are on so much broader and more luxuriant a scale that, as a nation, we have, so far, much less cause for fear than our European and Asiatic neighbors.

Our sanitary history is nearly contemporaneous with our Con-

stitution. In 1793 Dr. Benjamin Rush, the distinguished patriot and the most influential American surgeon of his day, gave an impetus to it by the methods he employed in subduing the yellow fever epidemic that prevailed in Philadelphia in that year. In 1799 the quarantine laws, established by the different States, were ordered by Government to be observed by the United States Marine Service. But little, however, was accomplished in the cause of sanitary progress until 1850, when the legislature of Massachusetts ordered the report of the sanitary commission of that State to be printed for distribution. In 1857 a National Quarantine Convention was called to assemble in Philadelphia. This was the first sanitary convention held in this country, and proved so popular that subsequent conventions were held in Baltimore in 1858, in New York in 1859, and in Boston in 1860. The Boston convention was the last, probably on account of the beginning of hostilities between the States.

During the war, 1860-64, decided advances were made in sanitary matters. The lesson of sanitary neglect taught England during the Crimean War, and the wonderful work of Florence Nightingale, were not lost on the United States in their hour of conflict. Camp policing and hospital management made sanitary education imperative and national. The necessities of the hour gave rise to the American Sanitary and Christian Commission, and the Western Sanitary Commission of the North, and the Wayside Hospital Service of the South. The work accomplished by these organizations was of vast assistance to the medical departments of both armies.

In 1869, the first State board of health was appointed in Massachusetts. In 1872, the American Public Health Association was organized, and the discussions, at its annual meetings, by sanitarians from all parts of the country, gave a decided impetus to sanitary progress. In 1873, the section of State medicine was instituted in the American Medical Association, which was itself organized in 1847. The establishment of boards of health in the different States, and of local boards in cities and towns, has gradually followed the widening growth of sanitary education. The necessity of national health laws has, of late, been clearly demonstrated, but their early enactment rests with the people rather than with the politicians. But the slow work of educating the people in sanitation will go on "without haste, without rest."

"Science moves, but slowly, slowly,
Creeping on from point to point."

Its progress rests upon the understanding of vital facts which, in time, will become as familiar as the alphabet.

SANITARY PROGRESS IN NEW JERSEY.

In the drama of sanitary progress, New Jersey has played a conspicuous part. In 1799, the first legislative act relating to sanitary science was passed. The act provided for the securing of the citizens of the State against the introduction of contagious diseases, and gave the governor plenary powers to prevent communication of citizens with vessels infected with contagious diseases, and lying in the Hudson or Delaware Rivers, when the officers of the vessels were disposed to evade the quarantine laws of New York or Pennsylvania.

In 1812, an act was passed to prevent the introduction of malignant diseases into Perth Amboy, which act provided that vessels, arriving between the last of May and the first of October from parts infected with yellow fever, should be quarantined. But little had then been accomplished by the State in the way of sanitary progress. Before organized sanitary work could be undertaken, it was necessary to procure the legislative support.

In 1866, the first definite movement was made in this direction. Early in that year, Dr. Ezra M. Hunt, the present secretary of the State Board of Health, conferred with Dr. Samuel Lilly, a member of the Court of Errors, and an ex-president of the Medical Society of New Jersey, as to the feasibility of a State sanitary commission. They presented the matter to Governor Marcus L. Ward, who approved of it, and invited several members of the legislature to a conference. This resulted in the passage of an act of legislature creating a sanitary commission, which was approved by Governor Ward. He appointed Dr. Ezra Hunt, Metuchen, president; Dr. Samuel B. Coleman, Trenton, secretary; and Drs. Richard M. Cooper, of Camden, Thomas Ryerson, of Newark, and Isaac A. Nichols, of Newark, as members of the commission. The commission were requested to furnish the Governor, at as early a date as practicable, with "such information and advice as they might deem important in reference to Asiatic cholera." They entered at once upon their duties with special reference to cholera, then prevailing as an epidemic. The president, Dr. Hunt, was called into service a number of times in cases of sporadic cholera. The commission embodied in a letter to Governor Ward important advice concerning cholera, which was extensively published by

the press of the State. This attracted public attention, and educated both press and public as to the course and prevention of the disease. The commission insisted that commercial highways, along which cholera prevails, should be guarded, and asked for certain restrictions, which were not given until a second letter was published. By judicious management, cholera did not become generally epidemic, but so far as the commission were able to ascertain, there were 200 fatal cases in the State.

In 1867, the commission presented a report to the legislature which included the consideration of (1) cholera, (2) the general sanitary condition of the State, (3) epidemic and contagious diseases, (4) vaccination, (5) the insane, (6) the condition of poor-houses, (7) vital statistics, and (8) workshops and workmen. The subject of cholera received close attention in the report, and the portability of the disease, as well as the effect of disinfectants and of sanitary laws on its propagation, were ably set forth. The commission also suggested, what is now in operation, that every city and town in the State should have its local Board of Health, vested with power to determine what constitutes a nuisance, and with authority to remove the same. The report also presented the need of laws relating to contagious diseases, and suggested that vaccination of school children be made obligatory, and for the indigent, gratuitous; that accurate and classified statistics of the insane and idiotic be prepared; that the feeble-minded be separated from the demented; that a statist be appointed to properly collect, arrange and record vital statistics; that employers should protect employees against overcrowding, bad ventilation, etc., in factories and workshops, and that a general health code be enacted. The duties of the commission were not meant to be final, but introductory, and suggestive of future enlightened action. With the disappearance of cholera, the commission was dissolved, since the legislature did not deem a permanent commission necessary. But a good foundation had been laid. Public interest had been aroused. The subject of public health and statistical record was pressed upon medical attention from time to time by Dr. Hunt. In this work, Surgeon-General Varick, and Drs. Richard M. Cooper, Lewis W. Oakley, William Elmer, Franklin Gauntt and others took an active interest, and helped to pave the way to subsequent State action.

It was not, however, until 1874 that farther legislative effort was made. Then Dr. Hunt and others asked the legislature

to appoint a Health Commission "to examine into the sanitary needs of the State, into any defects of existing laws bearing upon the prevention of disease and, in general, to inquire what ought to be done by the State toward conserving the physical welfare of its citizens." This request was complied with, and a second health commission was appointed by the Governor at the expense of one hundred dollars. It was composed of the following gentlemen: Dr. Ezra M. Hunt, chairman; James R. Mercien, Jersey City; Dr. Samuel Lilly, Lambertville; Prof. George H. Cook, New Brunswick; Dr. William Elmer, Trenton, and Dr. Lewis W. Oakley, of Elizabeth. The commission presented a report, prepared by Dr. Hunt, published in the spring of 1875 and extensively distributed throughout the State, which greatly increased popular interest in sanitary matters. In this elaborate report the commission defined the object and effect of sanitary laws, claiming that they should not alone be mandatory, but instructive and regulative, and that the enforcement of such laws is, in itself, an education. The commission discussed contagious diseases, drainage, water supply, sewerage, garbage and ventilation from a legislative standpoint as to their abatable conditions. They reported, in conclusion, the need of actual facts as to our hygienic condition, and recommended (1) that vital statistics include not only the number, but the cause of death; that (2) the State should look after the public health, and diffuse sanitary information; that (3) there should be a central council of sanitarians, which should take charge of vital statistics and suggest from time to time, to the legislature new sanitary laws, and that more stringent laws should be enacted to protect citizens from nuisances and sources of disease. In June, the commission issued a circular containing inquiries about various sanitary matters, and addressed to both physicians and laymen throughout the State, asking for such co-operation as to enable them to judge of the sanitary needs of the State. The answers received satisfied the commission of the need of wider knowledge in public health matters.

On September 24, 1875, a call was issued for a sanitary meeting at Newark for October 13. At this meeting, there were delegates present from Orange, Elizabeth, Belleville, Hackensack, Jersey City, Rahway, Passaic, Metuchen, Trenton, Bloomfield and Montclair. The convention was called to order by Dr. S. B. Hunt, of Newark. A temporary organization was effected by the

election of Dr. Stephen Wicks, of Orange, chairman, and Dr. S. Hunt, of Newark, secretary. The permanent officers for the session were: Dr. Samuel H. Pennington, of Newark, president; Drs. J. Henry Stone, Rahway; Franklin Gauntt, Burlington; Alfred Mills, Morristown; Henry A. Hopper, Hackensack, and A. N. Dougherty, of Newark, vice-presidents; George Werts, of Paterson, secretary, and Drs. Ezra M. Hunt, J. A. Nichols and Lewis W. Oakley, members of the executive committee. The following papers were read: "Atmospheric Humidity in Relation to Sewerage and Drainage," by Dr. S. B. Hunt; "Removal of Mill Dams and Construction of Sewers at Rahway," by Dr. J. K. Shotwell; "General Principles of Drainage, Sewerage and Water Supply," by General E. L. Vielè; "Types of Diseases at Burlington," by Dr. Franklin Gauntt, and "Water Supply of Jersey City and Adjacent Towns," by Prof. A. R. Leeds. The address of Dr. Pennington was received with much favor, and printed in full, with the transactions of the convention, in the *Newark Daily Advertiser* of October 14. The following resolutions were adopted:

"That the members of this association at once proceed to the formation of sanitary associations in their respective localities."

"That the subject of State water supply be commended to the consideration of these local societies."

"That a committee of five be appointed to report next year on the subject of water supply."

Prof. Leeds, General Vielè, Albert Beach and Drs. Pinkham and Bodine were appointed on the committee. The permanent officers elected for the ensuing year were: Prof. George H. Cook, New Brunswick, president; Dr. J. A. Nichols, first vice president; Dr. John A. Stearns, Trenton, second vice-president; Mr. George Werts, Passaic, recording secretary; Dr. Ezra M. Hunt, Metuchen, corresponding secretary, and Dr. Samuel H. Pennington, Newark, treasurer. The executive council consisted of Drs. S. B. Hunt, W. P. Lyman, L. S. Dennis, Senator Potts, Frederick Bourquin and Dr. Franklin Gauntt. The convention adjourned to meet at New Brunswick in the following year. From the first it met with the favor of the sanitarians, and to-day, as the New Jersey Sanitary Association, it is one of the influential forces of the State.

No legislative action was asked for at either of these meetings, or obtained by the convention. But the corresponding secretary, Dr. E. M. Hunt, untiring in his efforts to farther the

cause of sanitation, visited Europe in 1876, in company with Surgeon-Major John S. Billings, U. S. A., for the purpose of inspecting hospitals and of studying sanitary questions. Returning in January, 1877, profoundly impressed with the sanitary needs of our State, he conferred with Senator George C. Ludlow, who introduced and supported a bill to "establish a State Board of Health," which was approved March 31, 1878. The bill met with favor in the Senate, but encountered such opposition in the House as to require a presentation of all the facts in evidence to secure its passage. The original bill did not include vital statistics, because this subject was not well understood. To secure this, a conference was held the next year between Dr. E. M. Hunt, Dr. E. J. Marsh, Hon. George C. Ludlow, Hon. William Magee, Hon. G. A. Hobart and Hon. F. A. Potts, which resulted in a special bill as to vital statistics, and in the securing of its passage. Governor Beedle approved of the bill, and expressed anxiety to appoint those who would give the measure success. The following persons were appointed members of the Board: Ezra M. Hunt, M.D., E. J. Marsh, M.D., Ezra A. Osburn, C.E., Laban Dennis, M.D., Professor Cyrus Brackett, James M. Ridge, M.D., Theodore R. Varick, M.D., and Hon. H. C. Kelsey and Hon. John P. Stockton, *ex-officio*. In May, 1877, the organization of the Board was effected, and the plan of a "Department of Health and Vital Statistics" was thus outlined and authorized.

The Board from the first took a wide and comprehensive view of its sphere and privileges. A critical examination of its reports and circulars shows that a definite plan was pursued, which was the diffusion of sanitary information, first, among the members of the medical profession; and second, among the people. Next to physicians, the board enlisted the interest of civil engineers, teachers, architects, chemists, plumbers, and members of other allied callings. Even the agricultural population was reached through information given concerning the care of animals in contagious diseases. By its reports and circulars, by the use of the press, by conferences with boards of trade, local boards of health, common councils and mayors of cities, and by talks on sanitary subjects, the Board educated a sentiment throughout the State so favorable to sanitary progress, that the laws relating to public health have been revolutionized. In the accomplishment of this, the New Jersey Sanitary Association, whose transactions

the Board of Health have published from year to year, materially assisted.

Having considered the history of the organizations of the State Board of Health and that of the New Jersey Sanitary Association, let us inquire more specifically what each has accomplished in the matter of sanitary progress. The State Board of Health has had a distinctive plan from the first. This plan, as stated, has been educative in all of the branches and bearings of sanitary science. Besides the education of the people, the Board secured a series of laws which gave to itself necessary powers; provided for the organization of local boards of health, determined definitely their sphere of action, and provided for the return and the recording of vital statistics from the cities and townships of the State. Its code of sanitary laws is not excelled by that of any other State. The record of the progress of the Board may be found in its sixteen annual reports, in its eighty circulars, its Inspectors' Guide, in the score of laws passed, and in its consolidation of various acts in the health laws of 1886, 1887 and 1888. Its course has been steadily progressive, as the original laws, with their additions, alterations and enlargements, plainly show. Its progress has been difficult, because all legal precedents of the State were in favor of common law, and the slow methods of indictment by jury system. Sanitary law and administration can only be successful with police and summary methods. This principle the Board strenuously urged. In 1879 the secretary, Dr. E. M. Hunt, read an address before a legislative commission, consisting of Hon. Barker Gummere and Hon. William Magee, and obtained the admission that this principle was necessary and right, although the decision of the courts and precedents were against it. They advised the Board, through the Secretary, to persevere and establish a precedent. To do this it was necessary to overthrow the old custom of boards of health being committees of common council, or deriving their powers from indictment by grand juries, and to gain for local boards of health power to define nuisances, and to provide for their abatement without judicial proceedings. In the case of the city of Camden *vs.* Hutton, the Court of Errors declared that the health boards had no power to decide as to nuisances. The changes in the laws since then, by which the Board of Health has gained this power, present a striking contrast. The reports and special circulars of the State Board of Health educated popular sentiment

in its behalf, and contributed much to these changes in the law. No sanitary subject seems to have escaped practical consideration in these reports. With the public enlightened, the importance of sanitary science becomes quickly appreciated. Provision has been made for a health board in every city, town and township, supported by legislative acts, which give each board full power to pass, alter, amend and enforce ordinances on fifteen sanitary subjects, besides general power over all nuisances. The work of the State Board is largely educational and advisory; that of the local boards administrative. This completed the entire system of sanitary jurisprudence for the State, except in Hudson County, where the law has many of its functions exercised by a county board.

Having briefly considered the work accomplished by the State Board of Health, let us now inquire what farther should be done to increase our sanitary interests. But little, it may be said, except to preserve the law in its entirety, and to protect it from disturbing legislation. This requires watchfulness on the part of the State Board, and of this Association, in order to prevent the enactment of crude laws which would disturb the general system. Defects, however, are few in the State law. Judge Laning says: "We do not so much need additional legislation by the State as additional and intelligent legislation by local boards of health. For this the State law amply provides in powers delegated to them for the passage and enforcement of ordinances." Two suggestions were made by Judge Laning in the last report of the State Board of Health. They were in substance as follows: First, for the larger cities, greater discretionary power should be given to the boards of health as to the amount of money that may be expended to execute properly the fifteen powers delegated to such boards; second, "That the State Board of Health should have the right to apply to the Court of Chancery for an injunction to restrain a nuisance, or a business hazardous to the public health, in all cases in which the proper health board fails to act, and in all cases where the nuisance or business affects the health of the citizen within the limits of two or more sanitary districts."

Counselor William I. Lewis, of Paterson, in speaking of the health law of 1887, says, in the last annual report of the Board: "That while local boards were enabled to abate a nuisance existing on property, and to recover from the owner the expense incurred, yet that where the owner was a non-resident, in which

case recalcitrancy is most often found, the fact that the recovery of the amount must, according to the form of the statute, be by action of debt, precludes recovery by the board, but that an amendment to the act, allowing a recovery by attachment, would give ample remedy in such case."

But there are other needs of importance, especially to local boards. Freedom from political control and an increase of sanitary knowledge by the members are both needed to accomplish the best results. And, too, it must be said that the relationship that the medical profession bears to health boards is not fully appreciated. With the State Board of Health as a model, a corresponding amount of intelligent activity and business methods on the part of local boards would materially build up the sanitary defences of the State, and widely diffuse the knowledge to maintain them.

And now a word in regard to the New Jersey Sanitary Association. Since its organization the association, by its annual meetings, by the publication of its transactions, and by the comingling of sanitarians from all sections of the State, has added largely to the progress of sanitary science. Its members have aimed to contribute papers in which sanitary matters have been dealt with in a specific way, and which have, therefore, possessed a positive value. May the association continue in this high aim; may it encourage scientific study and enlighten public sentiment; may it promote the interests of sanitation by mutual acquaintance and interchange of ideas; may it never cease to disseminate knowledge, and to watch over the interests of the State.

When the population of New Jersey thoroughly understand and practice the simple rules of public health, when our architects, builders and plumbers are encouraged to make use of the best sanitary appliances in our homes and in public edifices, when the medical and legal professions exert all their influence in favor of sanitary jurisprudence, when local authorities and State government appreciate the importance of public health to the taxpayer and wage-earner, when, in short, we have done all in our power to advance the cause of health, then, and not till then, will our work be done.

It rests with you, gentlemen, as members of this association, to hasten, by your united efforts, the coming of that day, and may it soon dawn on this fair State of New Jersey.

The Cause and Prevention of Diphtheria.¹

BY DANIEL STROCK, M.D.,

Of Camden, N. J.,

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THE cause of diphtheria is a problem the solution of which has engaged the attention of scientific men in all parts of the world, and while it cannot now be asserted that our knowledge of the subject is complete, yet enough has been ascertained to enable us to formulate certain rational plans of treatment, and to guide us in our efforts to prevent the dissemination of this dread disease.

The demonstration, by Pasteur, that morbid processes in the animal body were due to the presence of micro-organisms, pointed out the line of investigation that would possibly reveal the cause of diphtheria. And, therefore, as a result of patient effort, Klebs, in 1883, and Loeffler, in 1884, isolated a bacillus that now is recognized as the agent concerned in the production of the train of symptoms and phenomena known as true diphtheria.

While it is agreed that the Klebs-Loeffler bacillus is the cause of diphtheria, yet we must not fail to note that fatal pseudo-membranous inflammations of the tonsils, pharynx and larynx occur in which the Klebs-Loeffler bacillus is absent, and instead is found a streptococcus, which appears to be identical with the streptococcus-pyogenes. Although this variety of pseudo membranous inflammation may be uncomplicated, yet it is frequently found associated with scarlet fever or measles.

Recently Professor Prudden and Dr. W. H. Park, of New York, have published the results of their investigations of the agents concerned in the production of true and false diphtheria. Prudden made bacteriological examinations in twenty-four fatal cases of pseudo-membranous inflammations of the tonsils, pharynx and larynx, and in all of them the Klebs-Loeffler bacillus was absent; in all but two cases streptococci were found. Park has reported 159 cases of pseudo-membranous inflammations, and of this number in fifty-four only were the Klebs-Loeffler bacillus

¹ Read before the New Jersey Sanitary Association, at the meeting held at Lakewood, N. J., December 9 and 10, 1892.

found. In the other 105 cases streptococci were present in abundance. Martin, of Paris, in an examination of 200 children supposed to have diphtheria, found the Klebs-Loeffler bacillus absent in seventy-two, and of this class twenty-nine were croup cases. Various investigators, as Boginsky, Kolisko, Sevestre, Wurz, Bourges and others have found streptococci without the Klebs-Loeffler bacillus in pseudo-membranous inflammations occurring in scarlet fever.

From this we learn that not every case presenting the gross appearances of diphtheria is really true diphtheria in the sense that the causative agent is the Klebs-Loeffler bacillus. But in view of the fact that the other varieties of pseudo-membranous inflammations, due to the presence of streptococci, are infectious and fatal, even when unassociated with scarlet fever, the lesson to the doctor is that his duty to the patient and the family is just as grave as it would be if the bacillus of Klebs-Loeffler were present. Clinically, no distinction should be made so far as precautionary measures are concerned. Scientifically, efforts should always be made to differentiate; and this can only be done with the microscope and culture media.

Granted that the important part assigned to the Klebs-Loeffler bacillus in the etiology of true diphtheria is warranted by the results of the latest investigations, and there are but few who do not admit this, we are not thereby informed as to the laws governing its propagation and growth. Many of us know from observation that the life of the bacillus may be prolonged for many months and finally demonstrate its activity by causing the disease to develop in those brought in contact with the infected locality. Instances have been given where the contagion of diphtheria has been conveyed in clothing, in sewers, in water, and in milk; agar-tube cultures, after seven months' growth, are still alive; bits of membrane no larger than a pin point, kept in cloth, give evidence of activity after six months. These facts indicate that the germ of diphtheria is tenacious of life, and perpetuates its species under varying conditions of soil and environment; yet they do not inform us as to the circumstances dominating its development.

If we believe that the cause of diphtheria is a definite variety of living germ, with characteristics and a life history unlike any other living entity, then we must assume that there are certain positive conditions necessary for its growth and continued existence, as is the case with all other living things in nature.

To claim that its presence in a given locality is accidental, or that, because of unsanitary environment, by a process of rapid evolution, a harmless germ was transformed into one with pathogenic attributes; or, that by a special creative act it is caused to be where it did not exist before, are untenable theories.

No culture experiments have ever resulted in the development of a new type of disease germ; and we have no basis for the idea that nature is engaged in the special work of rapidly creating or evolving these minute agents of destruction, contrary to her methodical processes, as observed in the higher orders of animal or vegetable life.

We are constrained to believe that there are certain laws governing the origin and perpetuation of the bacillus diphtheriæ, but what they are cannot now be definitely formulated. But we *do* know that filthy or unsanitary conditions are co-existent with outbreaks of diphtheria, and there can be no doubt but that moisture, ordinary temperature and absence of sunlight and pure air, are important factors in developing endemics and epidemics of this disease. Farther than this, we enter into the domain of doubt and conjecture.

Some observers have thought they traced outbreaks of diphtheria to the spreading of human or animal manure upon land in the vicinity of human habitations. Others attribute its prevalence in cities to the frequent tearing up of the streets for paving, or trenching for various purposes. Some consider the prevalence of continued dry weather an important factor in developing the disease. Still others think it is due to drouth alternating with successive rain. It is supposed that variations of barometric pressure of the atmosphere, over foul and moist soils, causing "ground respiration" and possible liberation of pathogenic germs, may be one of the causes. But it is probable that the theories mentioned above represent coincidental conditions only; and they certainly do not enable us to determine why there should be a rapid proliferation of the germs at one time, under what seems to be conditions identical with those that obtain at another time, when diphtheria does not prevail.

Diphtheria is known to be contagious and infectious, and its prevalence in communities, after the appearance of one or two cases, is largely due to this fact. It is a matter of daily observation that if a member of a family takes the disease other cases occur in the household. Children sent from an infected house, as

a precautionary measure, may convey the affection to those who have not previously been exposed to contagion. The disease may be spread by the dried membrane or expectoration upon pillow-cases, sheets and articles of clothing. Investigation will demonstrate that a large proportion of those having the disease have been in contact with infected individuals or localities; and localities may be centres of infection for a year or more, if not radically disinfected. As bearing upon this point, I have knowledge of a house that was vacated the day following the funeral of a child dead of diphtheria, and it remained unoccupied for one year. It was then taken by a family consisting of parents and one child. In three weeks thereafter the child died of diphtheria. In the absence of any history of exposure to contagion elsewhere, we are forced to the conclusion that the second case in that house was the direct sequel of the first.

In my opinion the most potent agents in causing the spread of diphtheria in communities are the public schools, private and Sabbath schools. When we consider that it has been proved that the bacillus of this disease is found in the mouths of patients some days after the apparent recovery of the throat lesion, we cannot avoid the conviction that it must also be in the mouth of the destined victim for a variable period before their presence is manifest by the usual symptoms denoting invasion. Therefore that individual is a menace to her or his companions even during this period of apparent immunity. In many other instances the children are really victims of diphtheria while yet in daily attendance at school. In some of these cases, no doubt, the child, being anxious to continue its studies, does not feel ill enough to ask to remain at home. In others, where the little one speaks of feeling ill, the parents may not think it necessary to keep her from school; as it is not an unheard-of occurrence for some parents to reason that a complaining child must necessarily be a malingerer. In still other instances, the disease may be well advanced before the individual's attention is called to her condition by symptoms of pain and fever.

In any of these conditions the patient is a source of danger to her companions, and her presence at school may result in their infection and death.

I have recently had under my care a family in which five cases of diphtheria occurred. Two years ago an elderly lady died in that house with diphtheria. A few months subsequent to her

death the premises were vacated, and the present occupants moved in. This family of six small children lived there for eighteen months without illness, until two years had elapsed since the death above noted, when diphtheria developed simultaneously in four of the children. Naturally, the impression would be that here was an instance where diphtheria germs had remained inactive for two years, but finally conditions favorable to their renewed vitality had developed, and as a result a severe local outbreak occurred. But I really did not believe that was the solution of the problem, and upon questioning the mother closely I ascertained that another child had remained from school a day or two, because it did not feel well; and this child occupied a seat adjoining a scholar who had a few days previously been taken ill with diphtheria. Here was the explanation of the outbreak in that household. A child with an attack so mild that the true nature of the illness was not recognized by the family, and which, it was thought, did not require the doctor's attention, infected four other members, and caused one death.

This is but one instance in a great many where I have endeavored to trace a case of diphtheria to its source, and have been led to the school-house.

The milk supply is frequently the means of disseminating the bacillus of diphtheria, and as one of the causes of the spread of this disease it is worthy of serious attention. It is really a culture media for the germs, and is peculiarly susceptible to contamination. Within a few months past an outbreak of diphtheria in the town of Melrose, Mass., has been traced to the dairy of a man in whose family several cases of the disease occurred.

While it is not definitely known that prominent outbreaks of diphtheria are due to contaminated water, yet it is reasonable to suppose that in some instances this is the case. It is known that colonies of the bacilli will survive for months or years in favorable situations, and it is not improbable that the germs may remain active in water for a short time, at least. Wells in proximity to cesspools may thus become a source of danger to those who drink therefrom; and the water supply of cities, contaminated with sewage, may cause the diffusion of the specific poison. It is a well-known fact that epidemics of cholera and typhoid fever have occurred in this manner, and it is not improbable that the prevalence of diphtheria, in certain localities, has been due to this cause. The folly, not to say criminality, of allowing cities, con-

taining thousands of inhabitants, to take their drinking water from a source polluted by the refuse of a city containing hundreds of thousands, should be fully appreciated; and let us hope a day of advanced enlightenment may come when the police power of a State can be successfully invoked to save the people from themselves. The importance of guarding the water supply from contamination should be so thoroughly appreciated by all that the question of cost will not be a deterring factor. The so-called contagious diseases—diseases communicated through the agency of living germs—can never be eradicated as long as a large percentage of the people use water contaminated with human excreta.

In concluding this division of my subject, it may be stated that it is not known positively what are the conditions necessary for the infection of the individual, but it is supposed that a lesion, an abrasion of the membrane of the nose or throat, favors it. No doubt individual or family susceptibility is a predisposing cause.

Having what we may now deem to be definite knowledge that the cause of diphtheria is a living germ, we are in a position to understand the importance of preventive measures, and are enabled to intelligently resort to such agents as investigation and clinical experience have shown antagonize its propagation and growth.

The problem of preventing diphtheria has been simplified by the discovery of its bacillary origin, for we know that if we destroy the germ we will remove the cause.

The destruction of the bacillus may be affected by the various agents known as antiseptics or bactericides, and by a temperature of 212° or more.

It is unnecessary to enter into the details of isolating and caring for patients; of cleansing and disinfecting bedding, clothing, premises and attendants; the rules to be observed by the family in the event of the recovery or death of the patient; the precautions as to ventilation; the mode of sterilizing the discharges from the patient's throat, and the duties of undertakers. These points have been admirably set forth by Dr. Ezra M. Hunt, the able secretary of the State Board of Health, in the annual reports and in special circulars, and they are accessible to everyone.

But we may, with propriety, consider some of the questions of public policy in relation to the management of diphtheria, whether it occurs as an isolated case or a general outbreak.

Probably one of the most serious questions that may present itself to the health authorities is that of domiciliary quarantine. If thoroughly enforced, combined with disinfection of the premises and the effects of the occupants, there can be no doubt of its efficacy as a measure for the suppression of epidemics. But the hardships entailed upon the occupants of the house thus isolated from the community is fully recognized, and frequently the proper authorities hesitate to inaugurate this extreme measure of repression. The legality of house quarantine does not enter into this problem as a distinct issue, as it is a settled point of law that municipalities, in common with nations and States, may resort to this measure as a safeguard to the public health. But when we consider that the family quarantined may have been infected because of some previous dereliction upon the part of the health authorities of the city or town, the question of compensation might be raised.

In instances where, due to the lack of means, individuals ill with diphtheria cannot receive the proper attention or isolation at home, they should be removed to a hospital provided for this class of contagious diseases. Frequently several members of a family are infected consecutively because the premises are too small to allow of perfect isolation of the original case. It is to this class that removal of the patient to a hospital is particularly applicable; and it then becomes a measure of consideration for their own safety.

Prophylaxis involves supervision of the schools, both the week-day and Sabbath-schools. There can be no doubt that this disease is largely propagated through the instrumentality of these agencies, where large numbers of children gather and intimately associate during the hours of study and play. As between the sexes, the relations existing between the girls of a school are more intimate than the fellowship between the boys; and herein is an element of increased danger to the girls. The reprehensible practice of indiscriminate kissing is largely in vogue in the female department of schools, and is directly responsible for the transmission of this disease in a certain number of cases. As bearing upon this point, my own experience has been that the large preponderance of school children attacked have been girls. When we consider that, after invasion, there is undoubtedly a period of local activity, without pronounced symptoms, during which the germs are elaborating the ptomaine that will subsequently infect

the entire system, we can understand what a menace a child unconsciously affected with diphtheria in this incipient stage must be to her companions in a school room. I have met with a number of instances where children ill with diphtheria have passed directly from the school to the sick bed.

Therefore, as a measure of safety to the young, in whom there exists marked susceptibility to this affection, during the prevalence of diphtheria all public schools should be closed, and what are known as the infant classes of Sunday-schools should be dismissed until such time as the disease is in abeyance. If this were done, there can be no doubt that the progress of diphtheria in any community would be largely controlled before its ravages had made so many homes desolate.

My convictions upon this subject are very decided, and I feel that too much emphasis cannot be placed upon the assertion that attendance at school during the prevalence of contagious diseases constitutes one of the most grave perils of childhood. I am well aware of the difficulties that attend the solution of the problem, for we all admit the importance of these agencies for the education of the youth of our land. But when we reflect how many valuable lives have been, and may be, lost by reason of the dissemination of infectious diseases among school children, the closing of the schools during the prevalence of such diseases in neighborhoods should be considered one of the most important measures to be instituted for their eradication.

One of the potent factors in the dissemination of disease, and one to which but too little heed has been given, is the vacating of houses after the recovery or death of a patient ill with a contagious disease, and its occupancy by another family that up to this time was free from infection. As in the instance that I have noted, many houses are vacated as soon as a patient has recovered, or soon after the funeral; and in some instances almost immediately re-occupied by another family, who are ignorant of the danger they incur. It should be the province of health boards to prevent this. Physicians are required to give information of cases of contagious disease, and to report deaths due to such causes. For the purposes of preventing the evil above referred to, the original notice of the existence of a contagious disease in a house should be sufficient, and it then should be the duty of the inspector of the local board of health to caution the head of the family not to vacate the premises without first notifying the board of such inten-

tion to move, under the penalty of a fine sufficient to exert a deterring influence.

After the health authorities have received such notification of intention to move, then all the effects of that family should be thoroughly disinfected before they are allowed to be taken from the premises.

After the house is vacated, it should be unlawful to rent it again until it has been properly cleansed and disinfected; and the cleansing and disinfecting should be under the supervision of the Board of Health.

Boards of health should also be vested with authority to prevent families from vacating infected premises when in their judgment such removal would be detrimental to the health of the community.

As inspectors of boards of health are public agents, charged with the grave and responsible duties of stamping out contagious diseases, it should be mandatory upon them to give personal supervision to the cleansing and disinfection of premises *immediately* after notice has been given by the attending physician that such disease prevails in a house; and not wait, as is now the custom, until the malady has spent its force in the family. Then, after the recovery or death of the patient, the premises should be re-disinfected. Failure upon the part of a health inspector to personally examine infected houses at least once during the progress of a case of contagious disease should render him liable to penalties equally as severe as may now be visited upon the physician who fails to make prompt report of the existence of such patient in his practice.

To enact sanitary laws for the guidance of busy doctors, and impose penalties to insure their observance, and at the same time make other sanitary regulations and select men at a liberal salary to carry out their provisions, without the imposition of a penalty for non-observance of duty, is an unfair division of the responsibility of conserving the public health.

It should be impressed upon all who have to deal with this disease, whether in the capacity of sanitary officials or as medical advisors, that prophylaxis is the true and, perhaps, only sure way of combatting diphtheria.

If we accept as true the bacillary origin of the disease, then must we acknowledge that it is *primarily* a local affection, followed later by systemic involvement. But it is the *general*

symptoms that first attract attention to the patient, and frequently while yet there are no signs of pharyngeal invasion. Now, if the general involvement is due to a poison generated at the seat of local lesion, we must assume that such poison had been formed *prior* to the onset of malaise and fever. If so, then there is but one conclusion to be arrived at, and that is that the bacilli were present in the nares, pharynx or larynx, and had already generated sufficient poisonous products to infect the system *before* the characteristic exudate was apparent to ocular inspection. Thus, when the doctor is called upon to treat the patient, what was a local affection has now become a systemic disturbance, with perhaps, even at this stage, only slight evidence of localization. Hence it is now too late to prevent general infection, although treatment may modify the progress of the malady. Unfortunately the chances are that farther advance of the disease will not be prevented, for we must admit there is no known specific for this affection once it has seized a victim. Despite all treatment, the seemingly mild cases are liable to die of heart paralysis, and the severe cases may pursue an uninterrupted course to the grave. But this sweeping assertion must be qualified by saying that the death rate has been lessened within recent years, as the value of the recumbent posture as a life preserver is better understood; and the early use of antiseptic washes does modify, in some instances, the severity of the systemic poisoning. But, after all, these agencies are not specifics.

But if we anticipate the results thus depicted, and when the disease threatens a community or family, institute pre-invasion treatment of the cause by cleansing the unclean places, isolating those who are sick or have been exposed to the contagion, and remove the risk of the healthy coming in contact with infected localities, we may then have the satisfaction of securing the ideal results contemplated by the votaries of sanitary science.

Pure and Mixed Breeds.

A writer in the *New York Medical Examiner* brings forth evidence which he thinks tends to prove that pure breeds of men are longer lived than mixed breeds, and that the offspring of mixed races is not, as a general thing, as long-lived as the original stock, especially in the first removes. They are weakly, and prone to the reception of disease.

Healthfulness of Health Resorts.¹

BY HENRY MITCHELL, M.D.,
Of Asbury Park, N. J.



CHANGE of climate is, in recent years, almost invariably made subject to the advice of a physician. The generation of physicians who preceded us were rarely enabled to include this and certain other therapeutic and preventive measures within the limits of their professional advice, because the public had not yet become acquainted with the value of change of dwelling place in the treatment of disease, and because the comparatively limited resources of that period did not admit of the free expenditure of money which the practice of the art of hygiene often involves.

The relation of physician to patient has gradually been extended until it now affects details of daily life formerly considered affairs which the individual alone, unaided by professional advice, could himself best manage and direct. At a time not long distant the patient was always an invalid and the physician was employed solely to prescribe remedies.

To-day there is a class of patients, whose numbers are rapidly increasing, who apply to their physicians for advice and guidance in reference to nearly all matters which concern health without waiting until disease appears and death threatens.

The patient is advised concerning air, water, food, clothing, habits, exercise, pastimes, occupation and dwelling place. Inherited or acquired defect or weakness in the patient is studied, and tendency toward disease is met by appropriate treatment. Physiology and hygiene thus share with pathology and therapeutics in leading the way toward relief for bodily ills.

I desire at this time to present one point only in connection with these new relations between physicians and patients, viz., some considerations in the selection of climate. In the effort to obtain records which shall clearly and fully represent the conditions which constitute climate and to reach a satisfactory conclusion in reference to the influences which a given place will exert upon a given case, there has thus far been much difficulty. Meagreness and carelessness in voluntary observa-

¹ Read before the New Jersey Sanitary Association, at the meeting held at the Laurel House, Lakewood, N. J., December 9 and 10, 1892.

tions of meteorological phenomena, false deductions and designing misrepresentations, have all contributed to confuse and perplex the practitioner, and the whole truth concerning the climate and local conditions of some localities has thus been made almost unattainable.

The disappointment which has so often followed the trial of a carefully selected climate as a therapeutic agent seems to indicate that there are yet unknown quantities in climate which must have consideration before a high degree of confidence can be placed in predictions as to benefits which will attend the removal of a patient to a certain spot. The physician may select a locality which seems to be appropriate to a patient's needs, so far at least as altitude, temperature, sunshine, humidity and certain other natural features of climate are concerned, yet he rarely has information relating to the sanitary status of the town and dwelling to which it is proposed to send the patient. Nature may have provided pure air, pure water and clean soil, but artificial causes may have poisoned the air, the water and the soil, and transformed a healthful situation into a plague spot. Shall the physician ignore influences upon the health of his patient which are caused by pollution of air, soil and water?

Clusters of hotels and boarding houses exist in nearly every place which has distinguishing characteristics of climate, and often each such establishment has its leaking cesspools and privy vaults; its leaking drain pipes; its wet and musty cellar—the latter supplying air perhaps to the heating apparatus; its well has free communication with the polluted soil. The blindness of those who will not see affects the class of men who manage these establishments, and many of them appear determined to believe that the dangers which are charged to unsanitary conditions are much exaggerated and magnified. A policy of secrecy governs their dealings with the public concerning the disposal of waste fluids and all similar operations affecting health, so that nothing short of official inquiry will disclose defects in the construction of the mysterious network of pipes and fixtures with which these houses are generally fitted. If left to themselves these landlords, with honorable exceptions, will meet the popular demand for modern conveniences by exhibiting a fine display of bath-tubs, wash-bowls and water-closets, and give little concern to the source of the water supply or the disposal of the sewage. But the most highly decorated plumbing fixtures may

be furnished with polluted water, and they may discharge into waste pipes which pour out sewer gas into halls and sleeping-rooms. Glittering metal and gilded porcelain can be presented to the confiding patron as conclusive evidence that all of the sanitary features of the house are excellent, and 99 per cent. of the traveling public can be thus completely hoodwinked and dissuaded from investigation.

Frequent outbreaks of typhoid fever in farmhouses and in other isolated dwellings and in small villages have demonstrated that greater safety can be afforded in towns which are populous enough to be thoroughly organized and equipped with a public water supply, sewers and a sanitary police.

For widely separated dwellings the proportionate cost to provide good drainage and a safe water supply is far greater than for town houses, and as there is rarely any efficient, authoritative sanitary supervision in rural territory the chances become small that proper protection will be exercised over the health of the inmates of hotels and boarding-houses thus located.

Every place, therefore, for which it is proposed to obtain the patronage of medical men, should furnish to physicians, upon request, a statement by a health officer or other responsible authority showing exactly what the local sanitary conditions are.

Physicians should no longer consent to be put off with generalities, but they should insist upon being unequivocally informed what degree of protection against preventable dangers to health is offered by each health resort. Such statements or notices should include the following subjects :

- (1) Vital statistics.
- (2) Water supply.
- (3) Sewerage.
- (4) Scavenging.
- (5) Nuisances.
- (6) Habitations.

We should know the population together with the total number of deaths; the number dying at different ages, the cause of deaths, and particularly the number dying from preventable diseases.

Health resorts are justly jealous of the figures which make up the above-named tables, for while the healthfulness of other localities may be measured by these facts, yet in health resorts, owing to the large number of non-resident invalids, who appear

conspicuously in the mortality lists, and who are not counted in enumerating the population, such tables are deceptive, and lead a careless observer of the facts reported to believe that a high death rate means unhealthfulness for the locality. When the mortality records are carefully made, however, so that not only the name of the decedent and the cause of death shall be stated, but also, in the case of non-residents, the former dwelling-place and the date of arrival in the place in which death occurs, *then* correct comparisons can be made with other localities which do not possess a large transient population of infirm and sickly visitors.

For statistical purposes it is doubtless better to charge all deaths to the census population, for if the computation of the number of non-residents transiently dwelling in a health resort be left to the judgment of the local authority, there is thus offered a strong temptation to overstate or overestimate the number of this class of the population, and thus the resulting death rate reported from these districts would come to have no value whatever, but only represent the guessing capacity of the tabulator, with a probability that he would soon add dishonesty to his talents as a statistician.

The water supply of a health resort should be pure and abundant, if the place is to have the countenance and support of physicians. Surely the time has passed when any physician will be so thoughtless as to advise a patient to take up his residence in any locality where surface wells near dwellings are known to furnish the drinking water. We know that very dirty water may be continuously drank for a long time without causing illness, but we also know that when wells are so situated that domestic refuse can find its way into them, the appearance of diarrhœa, sore throat, and mayhap even that grim enemy, typhoid fever, may at any moment show that the specific causes of disease have mingled with the miscellaneous nastiness which has passed into the cesspool or other source of contamination which communicates with the well.

The disposal of waste fluids is the most serious problem in sanitation with which many health resorts find themselves confronted, for, as before remarked, the cost of providing good sewerage for small communities is far greater per capita than it is in large towns, and consequently makeshift methods are often to be found in such places.

Localities which will in future succeed in winning professional approval as health resorts will not only maintain the natural purity of air, soil and water, but they will also be free from all preventable conditions which offend the senses. Sound nuisances, including screaming whistles, hawk-venders, the ringing of bells, etc., are inconsistent with the business of entertaining persons who have left their homes in search of health.

The sentiment which should control in such places is founded in the desire to so control the affairs of the locality that visitors will wish to return again and again for rest and recreation, and find a retreat from confusion and bustle as well as from the dangers to health which beset a dweller in towns and cities which are managed in the interests of trade.

RESTATEMENT.

(1) Physicians control the patronage of health resorts.

(2) No health resort is entitled to confidence which does not maintain good sanitary conditions on all premises where visitors are received.

(3) Every health resort should furnish to physicians, upon request, a full and clear statement of facts, based upon recent inspections and correct records, relating to the provisions which have been made for the protection of the public health, and showing the conditions affecting health which exist on any specified premises within the district.

Disinfection in Milwaukee.¹

BY U. O. B. WINGATE, M.D.,
Commissioner of Health of Milwaukee, Wis.



ALL sanitarians at the present day generally concede that isolation and disinfection are the two most important measures to be used in controlling contagious diseases.

The method consisting of simply burning sulphur not being satisfactory, during the past year a disinfecting corps has been formed, and although it has been in operation but a short time it promises to be of great advantage and use to the city. Funds

¹ An abstract from the Annual Report of the Commissioner.

not being at hand to build a disinfection station, a resolution was introduced and adopted by the Common Council to appropriate out of the health fund the sum of \$2000 to establish and equip a disinfecting corps. It was decided to build a disinfecting van and patrol wagon, the former to be drawn by two horses, the latter by one horse; and the corps to be composed of three men, one to act as driver for the van only, the other two to perform the necessary duties of the corps.

The van and patrol wagon was built under the direction of Dr. A. B. Farnham, of this city, who has kindly given his time and the benefit of his thought and experience regarding this work



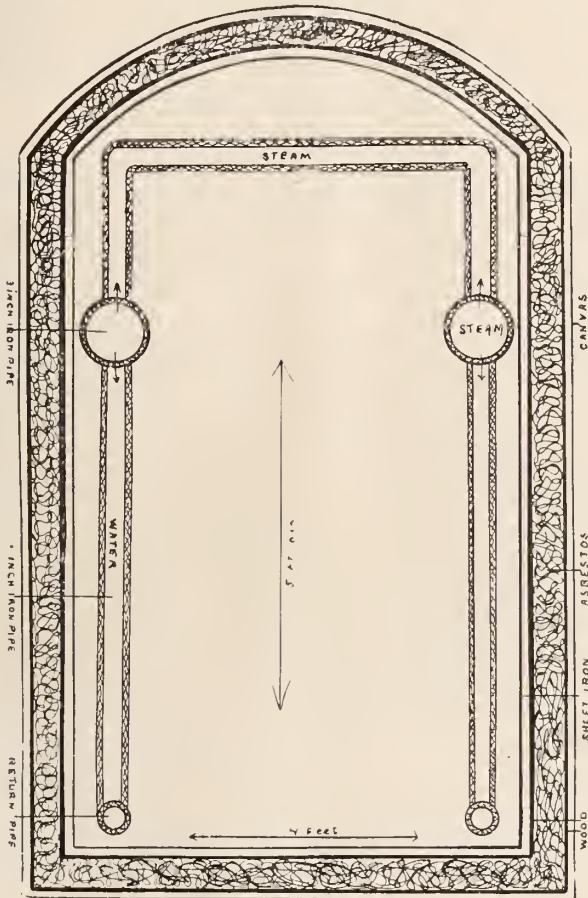
DISINFECTING VAN, CITY OF MILWAUKEE.

freely to the city, an act of generosity which can only be due to a regard for the welfare of humanity, rarely exhibited.

A description of this van and its operations is given in the following words by Dr. Farnham :

“Ten years ago the idea of a movable disinfecting van occurred to me while thinking over the best means of practically combatting cholera in the event of an epidemic. Extending the application of the van to other diseases, I endeavored then to have one constructed, but failing to receive the financial support needed, abandoned the idea. The present van and disinfecting patrol service are the old ideas put into shape. While aware of the exist-

ence of movable machines abroad, no models of such have been at all considered or consulted. So the present van is good or bad on its own merits. It has been in use now four months, and promises well. On the extreme cold days of winter it is not advisable to take it out, as the water freezes and damages the pipes. Its pri-



SECTION OF DISINFECTING VAN.

mary intended use was for preliminary disinfection; by this is meant a disinfection made immediately on the report of a case of contagious disease. Its object is to prevent the spread of disease among the inmates of a building by a patient or otherwise; among visitors, if any, or among outsiders, by the healthy members of the household carrying the germs of the disease in their clothing.

“Preliminary disinfection is carried out by a force of three men, called a disinfecting patrol. They are provided with two wagons, one a covered wagon for carrying the needed chemicals, disinfectants and apparatus, and the disinfecting van. This may be briefly described as a disinfecting chamber on wheels. Into this the furniture, carpets, bedding and clothing can be placed and then and there disinfected and returned to the house; with the patient properly isolated and the buildings and surroundings inspected and disinfected, the danger of the spread of the disease will be minimized. It is not to be forgotten that the patient had best be removed to a special hospital, but to educate the people to this takes time, and is not always practicable or desirable either. Milwaukee will make a good showing in this direction in time.

“The body of the van is of ash, twelve ribs on a side, eight in front and six on the roof, while the floor is laid in three-quarters-inch ash boards; the spaces in the sides and roof are filled with asbestos, lined on the inside with tin and covered on the outside with sail cloth. The doors are double. The dimension are: length, twelve feet; height, five feet six inches; width, four feet inside. The disinfecting agent is heat, and 250° F. is obtained in thirty minutes. The heat is obtained from pipes on the top and sides of the interior. A small sectional boiler is used, placed in one corner, and all valves and connections are placed on the outside. It is also so arranged that free steam can be admitted, as an advantage is claimed for disinfection by heat when steam is present. Charcoal is the fuel used. While heat is used, gas could easily be substituted when convenient.

“The weight is 4,750 pounds. The cost was about \$950, an amount much in excess of what another one could be built for.”

The accompanying cuts show the van, which is now in use, and the disinfecting corps are carrying out as thoroughly in each case as circumstances will permit the necessary instructions, but one or two more vans are really necessary in order to attend to every case, and we can only send the one now in use to the worst cases. It is to be hoped that the value of the work will soon be appreciated to such an extent that necessary funds may be appropriated to make the service more complete.

SMITH—You say he left no money?

Jones—No. You see he lost his health getting wealthy, and then he lost his wealth trying to get healthy.—*Sel.*

Suggestions Relating to Improvement of Quarantine.¹

BY STEPHEN SMITH, M.D.,

New York.



THE continued presence of cholera in Western Europe, and the recent arrival in New York Harbor of several steamships on which the disease appeared during the voyage, has awakened a new interest in the quarantine defences of this country. And this interest has been greatly intensified by the occurrences on the arrival of these vessels at the port of New York. They demonstrated the total incapacity of the most important quarantine in the United States to meet the emergencies that may arise at any time when travel and commerce are unimpeded. The apprehension which now prevails that there will be a recurrence of the epidemic in the seaport towns of Europe next season, and that the quarantine at this port will prove ineffectual, both in its appointments and management, to prevent the introduction of the pestilence into this country, will doubtless lead to efforts to secure State and National legislation, designed to remedy existing defects and evils. Whatever efforts are made should be based on principles established by sanitary science and recognized by the medical profession. It seems eminently proper, therefore, that this association, representing the profession of the State in which the chief quarantine is located, and by which it was established, is maintained and managed, should at this time consider this great public health question, and express an opinion which will tend to guide legislative action. In this view the following paper has been prepared.

The question of improving the quarantine of New York may be considered first, in respect to the enlargement and perfection of the present establishment; and second, with reference to supplementing or superseding it by a national quarantine.

The propriety of endeavoring to place our present quarantine in condition to meet the demands that may be made upon it early in the next season may be seen when we consider its construction and surroundings. The establishment is located on two artificial islands in the harbor. They were constructed at great expense by

¹ Read at a meeting of the New York State Medical Association. From the Medical Record.

the State, owing to the intense opposition of the people to the former location on Staten Island. This opposition was so violent that the former buildings were burned, and the legislature passed an act forbidding the location of quarantine on Staten Island and on Long Island. There was, therefore, no other alternative left to the State but to construct these islands. Like all work of this kind, the construction proceeded slowly, and the expense was very great. When finally completed, the quarantine consisted of two islands of limited capacity, one for the care and observation of well persons removed from infected ships, and the other for the care and treatment of the sick. Provision was made for but a single contagious disease. The capacity of these islands was for the proper care of a single infected steamship, with not to exceed 1000 passengers—of whom 150 might be "suspects," and 750 well, but who had been residents of this so-called infected ship. The arrival of two or more such ships in quick succession would, as was proved in September last, create such a congestion as would render it impossible to remove the well from the ships. The traveling public must not only be subjected to great hardships under such circumstances, but they would be exposed to the danger of contracting the disease prevailing on shipboard while at quarantine.

The only method of rendering our quarantine adequate to meet the demands of the increasing travel and commerce at this port is to enlarge its area. There should be ample surface area to extend its accommodations to a limit equal to the largest demand that can be made upon the establishment. But how is this enlargement to be effected? It is impossible to occupy any part of the shores of the bay belonging to the State, or any part of Long Island, for the purposes of a quarantine. Not only does the law forbid such occupation, but public opinion is so firmly fixed and determined that it will be impossible to secure necessary legislation to that end. The only method of enlargement is, therefore, by increasing the capacity of the present islands, or by the creation of new islands. It is only necessary to state these facts to prove that there is no possibility of relief from the present situation by attempting to improve adequately the present quarantine. The State will never be induced to incur the expense necessary to such an undertaking. Nor, indeed, should it be required to create and maintain a quarantine of the dimensions and cost which will meet the present and future wants of the

country. This is an obligation which now devolves upon the national Government, and it should be required to assume that obligation at once.

Fortunately, all of the conditions are favorable for the immediate organization and equipment of a national quarantine at this port. Sandy Hook, which belongs to the general Government, is, according to recent advices and events, immediately available for such purposes.

There are ample unoccupied lands which afford the necessary area for such an establishment, whether to meet present or any future requirements. The location can be thoroughly adapted to the wants of commerce, the anchorage is good, and the surface area and soil are all that could be desired for the arrangement and construction of the necessary buildings. Here can be created a station for infected ships, which will admit of the immediate removal of the sick and well from on shipboard, whatever their numbers may be. The sick can be taken to hospitals adapted for a variety of contagious diseases, and the well or "suspects" can be separated into any required number of isolated groups in pavilions, where they may have every convenience necessary to their comfort and health. Here, also, can be warehouses for the reception, cleansing, disinfection and ventilation of every form of baggage and every variety of cargo. And, finally, here can be maintained, in a state of constant efficiency, every agency essential to the rapid cleansing of an infected ship. With such a station in this harbor there would be no need of any proclamation of a twenty days' quarantine for the purpose of restricting immigration. Nor would there be prolonged detention of passengers for observation, nor the withdrawal of ships from commerce for long periods for proper disinfection.

Two questions will naturally arise in the minds of those who may not be familiar with recent national legislation in relation to the quarantine system of the United States: (1) Is it practicable to secure the location of a national quarantine in this harbor? and (2) If such a quarantine is established, will it not conflict with the State establishment?

The first question seems to be already answered in the affirmative. The Government has taken the initiative, and laid the foundations of a station that can rapidly be enlarged and adapted to supply every want and condition of the most perfect modern quarantine establishment, and in time to meet any emergency during the next season.

It may be objected that the camp created on Sandy Hook by the Government is a temporary expedient to meet an emergency, and that a permanent quarantine cannot be secured without legislation by Congress that would involve contention and delay. Happily this is not true; but, on the contrary, the creation of a quarantine in New York Harbor, and its complete equipment by the general Government, would be simply an extension of the policy which it has pursued for the last decade. A brief review of the course which the Government has followed during that period in regard to the protection of the United States against the introduction of contagious and infectious diseases will show not only that the establishment of a national quarantine at New York would be in accordance with its present policy, but will prove that the Government is under obligation to create such a station for the benefit of the commerce of the North Atlantic coast.

In 1880 the National Board of Health, after the suppression of the great epidemic of yellow fever of 1878-79, in the Mississippi Valley, began to inaugurate methods of preventing in the future the introduction of contagious and infectious diseases into this country. A careful inspection was first made of the quarantines of the United States, which, at that time, were all State and municipal organizations. It appeared from this inspection that our seaboard and Gulf quarantines were, with one or two exceptions, utterly worthless. As a rule they were maintained as a part of the local or State political machinery, with no pretence even of performing any useful public service. The best establishments were deficient in area, in buildings, and in appliances for the proper treatment of infected ships.

The plan adopted by the National Board to meet the exigencies found existing was to supplement these local quarantines by a series of national quarantines, called Refuge Stations. These stations were to be, and have been, located at such points along the coast as would be most convenient for infected vessels bound to ports in the vicinity. In pursuance of this policy stations have been created for the Gulf ports, one at Chandeleur Islands and another at Key West; for the South Atlantic ports one is located at Blackbeard Island, Sapolo Sound, off Savannah; for the Middle Atlantic ports, one is at Cape Charles and another at the Delaware Breakwater. In the same manner for the Pacific ports there is one at San Diego, another at San Francisco, and a third at Port Townsend, Puget Sound. The only part of our

seaboard that has not been supplied with these stations is the North Atlantic.

These refuge stations form a series of exterior quarantines, which are at all times to be maintained in a state of the greatest efficiency. They occupy isolated positions, generally insular, and have ample areas, admitting of any necessary isolation of passengers and their segregation into groups. They are to be fully equipped with every appliance required for the quick restoration of an infected ship to its service.

In practice, any infected or suspected vessel bound for a port in the district in which a national quarantine is located, would first proceed to this station and perform quarantine before it attempts to enter the port of destination. No local quarantine officer should allow such a vessel to enter the port which does not bring a certificate of having performed quarantine and been satisfactorily cleansed and disinfected at the national station.

The quarantine system finds its best illustration in England. The coast of that country is divided into quarantine districts, and for each district there is a single, well-equipped government quarantine. To this station every infected vessel must proceed and perform quarantine before it attempts to enter any port of the district. The great value of this system is seen in the thorough protection which it affords a country against the introduction of a foreign pestilence. It creates two lines of defences, an exterior, where the infected vessel and passengers receive prompt and efficient care and treatment, and an interior, at which every vessel, whether infected or suspected, is intercepted and turned back to the government quarantine.

Again, it insures at proper places along the entire coast thoroughly efficient quarantines, always ready for and capable of meeting any emergency. The importance of this fact will be recognized when we examine local quarantines in the absence of any alarm in regard to an epidemic. With rare exceptions they are allowed to go to decay, owing to the great cost of maintaining them in a state of efficiency. Perhaps the quarantine at this port has been more liberally sustained by the State than any similar establishment in the United States, and yet when a cholera-infected ship suddenly entered the harbor in 1887 it was wholly unprepared for the occasion. Though the next legislature granted a large appropriation, and very extensive additions and improvements were made, yet on the arrival of the recent cholera ships

much of its equipment was found to be too defective to be of any service.

In regard to the addition of the local to the national quarantines it is apparent that they should act in harmony. There should be no friction. The local quarantines should continue to immediately guard their respective ports against the introduction of any infectious or contagious disease, and two or three might perhaps be relied upon to quarantine vessels having the milder forms of these affections on board, but they should depend upon the national establishment to care for vessels bringing cholera or yellow fever, to meet any emergency.

If any legislation by Congress were necessary to place the national quarantine stations in their proper positions, it would only be necessary to pass a law dividing the seaports into quarantine districts, and require every infected or suspected vessel bound to any port to perform quarantine at the national station for the district in which the destined port is located. The same purpose would be accomplished if Congress would pass the following section of a bill reported by the Committee of Commerce and Manufactures to the House of Representatives, as early as May 7, 1796:

"Be it enacted, etc. The President of the United States be, and is hereby authorized to direct at what place or station in the vicinity of the respective ports of entry within the United States, and for what duration and particular periods of time, vessels arriving from foreign ports and places may be directed to perform quarantine."¹

The quarantine at the port of New York, in the event of the creation of a national station at Sandy Hook (or, indeed in any event), ought to be placed in the jurisdiction of the Health De-

¹ One of the most vigorous supporters of this bill was Mr. Smith, of South Carolina. He said: "If this question be a mere question of acquiescence in the State laws there might be a propriety in the Federal Government overlooking those laws; but it was essentially connected with the powers of Congress on an important subject. He had been surprised to hear gentlemen assert that this subject was not of a commercial nature. The gentleman from Virginia had said diseases were not articles of importation, or if they were, they were contraband, but gentlemen must know that importations of all kinds were under the regulation of Congress, and contrabands as much as any other. Consider how epidemics, imported, affect the United States at large. They do not merely affect the city where first imported, but they obstruct the commerce of all others; they not only embarrassed the commerce, but injured the revenues of the United States. Another point of view in which it had an effect; the laws regulating the collection of imports were counteracted and obstructed by the laws regulating quarantine, and would any gentleman say that a State legislature had the power to contravene the act of the Federal Government to obstruct all of the laws by which it collects its revenues?"

partment of the city of New York, which should be made responsible for its proper management. Its officers and employees should be appointed by that department, and the chief officer should be the sanitary inspector of the port. The laws relating to the government of quarantine should be repealed, and the health department should be authorized to make such rules and regulations relating to the inspection of vessels, their proper care, and the details of administration of the sanitary service of the port as it may from time to time deem necessary. Such a change in our quarantine establishment would of itself be an immense improvement, for it would be brought under the immediate supervision of a department which has a vital interest in its efficient and successful management.

The Prevention of Contagion.

BY WILLIAM M. WELCH, M.D.,

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[Concluded from page 17.]



LET us return to the consideration of smallpox in connection with the preventive measures used against that disease. Previous to vaccination smallpox was one of the most common and fatal diseases known. Even those who recovered from it were left disfigured for life, and many were rendered either partially or totally

blind. It was a rare thing to meet a person on the streets in those days who was not pock-marked; and in blind asylums the majority of the inmates owed their blindness to smallpox. The mortality from this disease was something alarming: one out of every four, often one out of every three attacked, was sure to die.

The first protective measure applied against smallpox was one tending to minimize its mortality by rendering the disease milder. I refer to inoculation. This practice was first introduced in Constantinople, about the year 1700. It reached England in 1721, through Lady Mary Wortley Montague, whose daughter was the first person inoculated in that country, her son having been previously inoculated in Constantinople. In the same year it was

introduced into this country by Dr. Boylston, of Boston, who first inoculated his only son, 13 years of age, and two negro servants. The operation in these persons was successful, the result deemed satisfactory, and it was not long before the practice was adopted almost everywhere.

Inoculation, you know, consists in inserting into the skin of an individual a little smallpox matter, which in the course of seven or eight days gives rise to a genuine attack of the disease. Now, what were the advantages claimed for this procedure? Simply these: smallpox was so common in those days that but few escaped the disease; and, besides being very fatal, it was liable to occur at an inconvenient time, such as when the individual was absent from home, or after a man had married and was at the head of a large family of children depending upon him for support. By inoculation a person could select his own time for having the disease, and could prepare himself accordingly. The greatest advantage, however, was that smallpox induced in this way was very much milder and less dangerous than when taken in the natural way. While the death rate from natural smallpox was one out of every three or four persons attacked, it was, at the worst, only one out of fifty, and sometimes as low as one out of 500 from inoculated smallpox; the average being about one out of every 200 persons inoculated.

There were also disadvantages of great importance from inoculation. Smallpox induced in this way, although mild in character, was just as contagious as when contracted naturally. Therefore inoculation served to keep the disease almost constantly in existence. As a result of this it was found that the number of deaths annually from smallpox was greater during the inoculation period than prior to that time. Since the introduction of vaccination, inoculation has no longer any sphere of usefulness, and consequently has been prohibited almost everywhere by law.

I do not hesitate to say that there is no other discovery in medicine of so great importance to the welfare of mankind as vaccination. It has prevented more suffering and saved more lives than a dozen of any other discoveries put together. Its discoverer, therefore, has made his name immortal. I think it is generally conceded that up to the present time the name of Edward Jenner stands at the very head of the long list of benefactors of the human race. In commenting on the boasts of warriors as compared with the claims of public benefactors it has

been well said that, "Saul may have boasted of his thousands slain, and David of his ten thousands, but the altar of Jenner is not consecrated by hecatombs of the slain; his claim is that of having multiplied the human race, and happily invoked the Goddess of Health to arrest the arm that scatters pestilence and death over the creation."

The history of the discovery and introduction of vaccination is full of interest, but I have time only to refer to it in a very cursory manner. The question of cowpox protecting against smallpox seems to have first attracted the attention of dairymen, in England, about the middle of the last century. An impression evidently prevailed at that time among this class of people that persons who had been accidentally infected by the matter exuding from certain sores which sometimes appeared on the teats and udders of cows, and known as cowpox, were insusceptible to the contagion of smallpox. Edward Jenner, a physician residing in Berkeley, England, where dairy farms were very numerous, had his attention first called to this subject when he was yet a student of medicine by hearing a country woman remark that she could not take the smallpox because she had had the cowpox. After his graduation he began to examine into the truth of this tradition, and it was not long before he was convinced that there was a reality about the matter. He frequently expressed his belief in the prophylactic power of cowpox to his professional friends, but they invariably pooh-pooched the idea. After closely observing for several years the evidence in its favor, he began to test the truth of it by experimentation. The first person whom he vaccinated was James Phipps, a boy, aged 8 years. The matter used in the operation was taken from the hand of a girl who had been accidentally infected by milking a cow. This first vaccination was done on May 14th, 1796. After the vaccine disease had run its course Jenner decided to test its prophylactic power against smallpox, and accordingly on the first or second day of July following he tried to give this boy smallpox by inoculating him with smallpox-matter. This made no impression whatsoever on the health of the boy. He repeated this operation several times, but invariably with negative results. After some farther experiments of the same kind, and with like results, Jenner prepared a paper on the subject, detailing his experience, and presented it to the Royal Society of London, thinking that if the discovery was given to the world

through this Society it would be more speedily and generally accepted. This highly honorable body, however, referred the paper to a committee composed of some of its most distinguished members, and they, after considering the communication, reported against its acceptance and publication. On handing the paper back to Jenner, these learned gentlemen reminded him that he had already made for himself some reputation through his investigations relating to the cuckoo, and volunteered the advice that he should not risk that reputation by publishing anything so absurd as vaccination. Little did this Royal Society then think that it had refused to accept and publish the most important paper ever brought before it, or, indeed, before any medical society in the world.

Jenner was not discouraged by this rebuff, for he had already convinced himself of the reality of his discovery, and therefore was prepared to stand by it until its merits should become fully and generally recognized. After this visit to London he returned to his home in the country and pursued his investigations still farther; then he re-wrote his article on vaccination, and published it in book form. This publication was made in 1798. The subject at once attracted great attention from the medical profession, especially in England, some commenting on it favorably, and others unfavorably, while still others resolved to test the question for themselves. The result of all this was that it was not long before the protective power of vaccination was proven by numerous investigators, and it was then gradually adopted, not only in England, but in most other countries also.

I would not have you think that vaccination was accepted without opposition. Like all new discoveries and innovations it was first doubted, and then accepted by some, while others persistently opposed it, even after its efficacy had been well proven. Some, indeed, carried their opposition so far as to make personal attacks on the honesty and veracity of Jenner, and predicted that if the practice of introducing animal matter into human beings be continued it would eventually have the effect of transforming man into some horrid monster presenting the characteristics of both man and beast. Jenner paid but little attention to these harsh criticisms and personalities, but was ever ready to defend his cause, and this he always did with great earnestness and ability. It was not long, however, until the merits of vaccination were generally recognized, and the nobility

and peasantry alike availed themselves of its benign influence. In order to meet, to some extent, a debt of obligation which England afterward felt that she owed to Jenner for his great discovery, the British Parliament voted him an honorarium of £30,000.

The history of the introduction of vaccination into this country has many interesting features, and I cannot pass it over without some reference to the laudable work of its early advocates. It was first practiced in Boston by Dr. Benjamin Waterhouse, then Professor of Theory and Practice of Medicine in Harvard College. On hearing of Jenner's discovery, Waterhouse wrote to England for a supply of cowpox virus, and after receiving several inert samples he at length received some in an active state, and with this he at once vaccinated his own children. The first vaccination was done July 8, 1800, on his oldest child, aged five years. Finding this case did well, he then vaccinated the rest of his children with equal success. In order to test the protective power of these vaccinations against smallpox, Waterhouse subjected his children to a very severe ordeal. After the vaccine process had run its course in all of his children he took them into the smallpox hospital and exposed them freely to the effluvia of that disease. Finding they resisted the contagion, he then had them inoculated with smallpox matter taken directly from a patient. This even made no impression on them. Waterhouse was then convinced, as every reasonable man should have been, that vaccination affords protection against smallpox, and very truly remarked, "One fact, in such cases, is worth a thousand arguments." Yet it required, strange to say, many such facts, and no little argument, before vaccination was accepted and introduced into all parts of this country.

Next to Waterhouse, the man who did most to disseminate the benign influence of vaccination in this country was Thomas Jefferson, then president of the United States. Hearing of Waterhouse's efforts in this laudable work, the President sent him a congratulatory letter containing these words: "Every friend of humanity must look with pleasure on this discovery, by which one evil more is withdrawn from the condition of man; and must contemplate the possibility that future improvements and discoveries may still more and more lessen the catalogue of evils." This letter convinced Waterhouse of the truthfulness of what he had already heard, namely, that the President was deeply

interested in the subject, and so he concluded to forward to him some vaccine virus to be disposed of as he saw fit. The first, second and even the third lot forwarded failed to produce any effect whatsoever. Finally, the President suggested that, as the weather was warm, the virus might be sent in a sealed vial and this vial immersed in a larger one filled with water. The virus thus conveyed was, on August 6, 1801, introduced into the arms of some members of the President's family, and it succeeded; and thus was vaccination introduced at the Capitol of the United States.

To Jefferson also belongs the honor of having sown the seed of vaccination in Pennsylvania, Maryland and all of the Southern States. He furnished the virus for the first successful vaccination that was recorded in this city. It was received by Dr. John Redman Coxe, who used it on November 9, 1801. Jefferson did not rest content by simply disseminating vaccine virus; he, like Waterhouse, sought to know whether the disease induced by this virus was really protective against smallpox. In his letter accompanying the vaccine sent to this city, he asked that some fresh smallpox matter be sent him in exchange, that he might, as he said, test the genuineness of his vaccine inoculations. As to the result of this test, I find no record. We may rest assured, however, that these vaccinations stood the test of variolous inoculation, for, if they did not, the fact would have been recorded, if not by the friends of vaccination, surely by its enemies, for the latter could be found everywhere.

The vaccinations of to-day are just as protective against smallpox as were those in the time of Jenner, Waterhouse and Jefferson. Frequently have I seen entire families brought into the hospital of this city, every member of each family suffering from smallpox, except one or two small children who had been so fortunate as to have been recently vaccinated; and I have seen these children live, eat and sleep in a ward containing several smallpox cases, and still remain wholly unaffected by the contagion. When whole families are sent to the hospital under similar circumstances, it often happens that one or two of the children have not yet sickened with the disease, and are found to be unprotected by vaccination. In such cases vaccinations are promptly performed, and not infrequently with the result of conferring absolute immunity against the variolous infection.

During the early days of vaccination a difference of opinion

arose among the physicians of a certain town in the state of Vermont in regard to the adoption of vaccination, or the continuance of variolous inoculation—some preferring one, and others the other. A town meeting was called to consider the question, and it was decided to appoint a committee to test the protective power of vaccination. The committee, in which both sides of the question was represented, assembled at the smallpox hospital to make the experiment. This consisted, first, in selecting seventy-five persons from among the men, women and children who had recently been vaccinated and inoculated them with smallpox matter taken warm from the pustules of a patient ill with the disease. The result was that not one of the number took smallpox. Strange to say, the committee was not wholly convinced of the efficacy of vaccination by this strong proof, but expressed a desire to find some woman with a nursing infant who would be willing to let the infant be vaccinated and continue to nurse, while the mother herself suffered from smallpox. To gratify this desire, a woman was found who heroically offered herself and child for the experiment. The infant was first vaccinated, and forty-eight hours afterward its mother was inoculated with smallpox matter. The vaccination progressed regularly in the child, and so did the smallpox in the mother, nursing being continued by the child all the time. The mother had a considerable number of pustules on her body, face and breasts, some of which were kept raw by the lips of the infant while sucking; and yet *“the child,”* as the reporter tells us, *“appeared as well throughout the whole process as if it had been nursed by a person not suffering from smallpox.”* After this evidence the committee asked for no farther proof. I might add that I am not surprised at the result of this test, for I have more than once seen infants protected against smallpox under conditions quite similar.

All along down the present century there may be found in the literature of medicine innumerable accounts of vaccinated persons resisting entirely the contagion of smallpox, while from like exposure the unvaccinated have suffered and died to an alarming extent. Stanley tells us that in his expedition through Africa he encountered smallpox among the natives, and that they perished in large numbers. His own men, however, although equally exposed to the contagion, suffered only to a limited extent. The natives were unvaccinated; while among Stanley's men this preventive agent was employed.

The question as to the length of time an infantile vaccination will confer protection is one of great interest. Jenner believed that it would continue during the lifetime of the individual, and this view was generally accepted by the early vaccinators. But as time rolled on it was found that persons who had been vaccinated in infancy very frequently took smallpox as they approached adolescence. The common notion that a person's system changes every seven years led some to believe that vaccination should be repeated at such intervals. In order to test this theory Waterhouse had his children taken into the smallpox hospital and inoculated the second time with smallpox matter after they had been vaccinated seven years, and found that they were still insusceptible to the contagion of that disease. He then believed firmly in the permanency of the vaccine influence, and accounted for smallpox occurring subsequent to vaccination by assuming that in such cases the operation had not been skillfully performed.

But there is now no longer any room for doubt about the wearing out of vaccine impressions made in infancy. It is true that in some persons—perhaps about one-third of those vaccinated—the protection will continue throughout the remainder of life. But in the other two-thirds susceptibility to the infection of smallpox will return, either partially or wholly, as the individuals pass from childhood to adolescence or adult life. Not knowing to which class you belong, it is not only your privilege, but your duty—both to yourselves and the community—to be revaccinated, especially when smallpox is prevailing. The facts supporting the value of re-vaccination clearly warrant such advice. Persons who have been vaccinated in infancy and successfully re-vaccinated at the period between childhood and adult life, rarely take smallpox; and when they take it at all, the disease is so mild that death seldom occurs.

The German army affords a very good illustration of the efficacy of revaccination. Every person joining the army must be vaccinated or re-vaccinated, as the case may be, and if this fails it is repeated until either success is attained or the surgeon is satisfied that the individual is insusceptible to the vaccine process. In joining the French army, neither vaccination nor re-vaccination was at the time of the Franco-Prussian war in any wise compulsory. During this war smallpox prevailed to an alarming extent, and both armies were about equally exposed to the contagion; but the loss by death from that disease in the German army was only 263 men, against 23,468 in the French

army; and the latter was at no time much more than one-half the size of the former.

In the smallpox hospitals of London, from 1876-79, where 11,412 cases are recorded as having occurred among persons who had been vaccinated in infancy, *not a single case was known to have occurred among those who had been successfully re-vaccinated*. It was the rule to re-vaccinate all nurses and employees before entering the hospital for service, and the number thus employed amounted to about 1000. Of these, only some half-dozen took smallpox, and they for some cause or other had escaped re-vaccination. The records of the hospital in this city for the last twenty-two years illustrate precisely the same fact with regard to this preventive measure.

When Jenner first discovered vaccination he believed and even asserted that it was capable of exterminating smallpox from the earth. This has generally been regarded as an extravagant assertion, and is often spoken of as "Jenner's dream." If, however, all persons were successfully vaccinated in infancy, and again at the age of puberty, the dream, I am sure, would soon be converted into reality.

You may want to know something about the dangers of vaccination. I have only to say that they are so infinitesimal as not to be worthy of your time to consider them. The advantages of vaccination are so infinitely superior to the objectionable features that the latter sink into insignificance by comparison. Any agent capable of conferring protection against a disease at once so loathsome as to separate the sick from the tender care of loving friends, and to prevent a Christian burial in case of death—so dangerous as to cause the death of one person out of every three attacked—so terrible as to disfigure for life those who are fortunate enough to recover, would, I am sure, in the age of the science of mythology, have been regarded as a gift from the Goddess of Health. Horace must have been moved by some such thought when he wrote :

"To thee shall weeping wives and mothers fly,
Or see their husbands and their children die ;
To thee the virgin trust her lovely face,
Or some rude blemish rifle ev'ry grace.
Oh, ward the perils that around her wait !
Oh, shield her beauties from impending fate !
Nor let a cruel pestilence destroy
The hope of youth and pledge of future joy !"

The Hygiene of Building Materials.¹

FOR the purpose of determining the hygienic properties of various building materials, Dr. A. Serafini, assistant at the Institute for Experimental Hygiene, Rome, Italy, has recently published the result of a series of successful experiments.

One of the questions studied was the porosity of materials of various sorts. This study was conducted by taking small pieces of the material to be investigated, drying them at a temperature above 100°, then placing one end of the mass in very hot distilled water. When sufficient time had elapsed to enable the mass to become saturated with water, the other extremity was immersed. By this means the air was driven out of the pores of the material as perfectly as possible. After cooling the moistened mass, and drying it with bibulous paper it was placed in a burette (a graduated glass tube) full of water, for the purpose of determining its exact volume according to the principle of Archimedes. The surface was then dried and the mass weighed, then dried at a temperature above the boiling point, until thoroughly desiccated, and weighed again. The difference in weight indicates the amount of water absorbed by the pores, the percentage relation of the volume of water to the volume of the mass being obtained. The following table exhibits some of the results obtained, the figures expressing the total volume of the pores in the respective materials compared with the volume of the mass examined:

Lime rock.....	44.62
Red brick made by machinery.....	32.79
Red brick made by hand.....	36.77
Travertine	4.44
Marble	0.25
Mortar from an old wall.....	33.88
Fresh mortar prepared in the laboratory.....	35.55

It will be observed that bricks made by machinery and strongly compressed are much less porous than bricks made by hand.

Experiments were also made for the purpose of determining the permeability to air of different materials. Equal amounts of different materials, with equal surfaces exposed and the same pressure of air, gave the results presented in the following table:

¹ From *Good Health*.

Red lime rock.....	122
Yellow brick made by hand.....	1131
Red brick made by hand.....	222
Yellow brick made by machinery.....	348
Red brick made by machinery.....	122
Travertine.....	11
Marble.....	0
Mortar taken from an old wall.....	15,667
Mortar prepared in the laboratory.....	37.00

In another experiment it was found that one square meter (a trifle more than a square yard) of a brick wall two feet thick, one-fifth of which was composed of mortar, transmitted in one hour's time, with a pressure equal to that of a water-column of two inches, 600 liters of air, or about twenty-two cubic feet.

It has been found that the amount of air transmitted through a wall in a given time is diminished by increased thickness, but not in direct proportion to the thickness, since increasing the thickness of the wall five-fold diminished the amount of air transmitted only one-half, while increasing the thickness of a wall twenty-five fold only reduced the volume of air transmitted to one-fourth.

The conclusion drawn from the last-mentioned experiment is not that which some sanitary authorities have drawn from similar experiments made by Pettenkoffer and others, that walls of buildings composed of ordinary building materials being porous, the artificial ventilation of buildings is a matter of small consequence; but rather, that since the amount of air transmitted by walls is so small, artificial ventilation must be depended upon as the only reliable means of fresh-air supply. A slight computation will readily emphasize the insignificant value of the permeability of building materials as a means of ventilation. An atmospheric pressure equal to a water-column two inches high, which amounts to over ten pounds per square foot, is only produced by a gale of wind traveling at the rate of forty-five miles per hour; the pressure of a light breeze is 500 times less, and of a strong wind only one-twelfth the pressure required to pass through a brick wall two feet thick, twenty-two cubic feet per hour.

It is apparent, then, that the amount of air which passes through the walls of well-constructed brick buildings under ordinary circumstances must be very small indeed, and utterly insufficient to meet physiological requirements, which demand

not less than 2000 cubic feet of air per hour for each person. To furnish this amount, a room with outside walls presenting a surface of 100 square yards would be required, or a room with two outside walls each twelve feet in height, and something over seventy-five feet long by sixty wide. Two persons would, of course, require a room double this size, and the necessary amount of air would then be furnished the inmates of such a room only when the wind was blowing a gale!

Studies pursued by Dr. Serafini, in relation to the heat-conducting properties of various kinds of building materials, are also of considerable interest. Taking as the unit of comparison, cork, the poorest conductor of heat employed as a building material, the relative heat-conducting properties of various substances was found to be as follows:

Cork	1
Red limestone.	1.56
Mortar	1.62
Red brick made by hand	2.08
Yellow brick made by machinery.....	2.24
Red brick made by machinery	2.52
Travertine	3.31
Marble	3.39

Studies were also made for the purpose of determining the relation of building materials to microbes, it being observed that one of the properties of the materials employed in construction is that of absorbing and retaining disease germs and transmitting them to the interior of buildings. A very interesting observation made was the fact that lime and mortar never contain living germs, and that by incorporating with such mortar in the laboratory various cultures of germs, no trace of them could be found at the end of twenty-four hours or after eight days. Old walls, however, contain living germs, even in their centres, as was proved by Dr. Sanfelice, a colleague in the work from which these facts are drawn. Dr. Sanfelice perforated with very great care and precautions a wall of the old hospital San Gallicano, at Rome. Great numbers of microbes were found in the very centre of the walls. The experiments made show, however, that the microbes of the air pass through building materials only with very great difficulty. A volume of air containing from 200 to 400 germs, was found, after having passed through a block of brick one and one-fifth inches thick, to contain only two microbes,

while a block of mortar of the same thickness removed all of the germs but a single one.

The question whether microbes may be made to penetrate building materials more easily when suspended in water, was also submitted to the test of experiment. It was found that when thus associated with water, microbes work their way into the interior of brick and other porous material with considerable facility. In one case germs were found to have penetrated four inches into a brick after it had been in contact with the culture for six weeks. The bacillus *prodigiosus* penetrated a block of limestone to a depth of four inches in five weeks, without pressure, and more than half the same depth in the space of two weeks.

The ready permeability of limestone, brick and other similar building material by germs renders important the adoption of means to prevent the saturation of walls with germs from contaminated soils. The method employed for this purpose in Rome, which seems to commend itself as being eminently satisfactory, is the interposition below the foundation of the wall of a layer of basalt, or very dense stones coated with basalt.

The author draws the conclusion, from the various experiments which he has made, that the lateral walls of buildings should always be made impermeable to air, not only to prevent the penetration of the walls by microbes, but to allow of frequent washing without the saturation of the walls with moisture. The only objection which has been urged against the rendering of walls impermeable is that of Trelat, who suggests that the porosity of walls should be maintained to all the penetration of germs, by means of which a process of nitrification similar to that carried on in the soil may be set up. By this means the organic matters absorbed by walls may be destroyed. Attention is also called to the fact that molds are more apt to adhere upon impermeable walls than upon porous walls, for the reason that porous walls absorb the moisture essential to the development of molds. Both these objections are without weight, however, when the fact is noted that impermeable walls would contain no organic matter to undergo nitrification, and hence would afford no opportunity for germs to perform a work of this kind, and the farther fact that the walls of a room, as well as the furniture contained in it, may be kept free from mold by frequent wiping, by which means also they will be kept free from dust, germs and other impurities.

Women as Hygienists.¹

T appears to me that there is no subject more important in the education of our girls, and to which less attention is paid, than the study of the laws of healthy living. In boarding schools girls are taught, I am told, history (ancient and modern), geography, different rules in arithmetic, botany, drawing and music, but are taught nothing at all about the structure, growth and nourishment of their own bodies; nothing at all about the functions of the skin and the necessity of cleanliness; about the functions of the lungs and the necessity for good ventilation by day and night; about the functions of the digestive organs, and the necessity of wholesome, properly prepared, food.

Even in high schools and expensive boarding schools, where the girls go in for Cambridge locals and such like tests of knowledge, it is the exception when physiology is one of the "ologies" taught. A girl will pull a flower to pieces, telling you the Latin name of each delicate stamen and petal, who would stare helplessly at you were you to ask her how many ribs she has, or what are the functions of the liver? She will tell you the names and probable ages of the geological strata forming our earth's surface, and will be astonished to be asked how many layers of skin cover her own body.

Now, I think it will be generally admitted that the health of the whole household depends, to a great degree, on the woman at the head of it. If she is a wife and mother, husband and children are alike, to a large extent, at her tender mercies. She provides the food, admits light and air into the house at her pleasure; she selects the clothing at any rate for the younger and more dependent members of the family. She is applied to on the occurrence of every accident, from a cut finger to a broken limb. She has to note the first symptoms of illness, and to nurse the sick. Should the woman at the head of affairs not be a wife and mother, but a sister or maiden aunt, or even a paid housekeeper, it is all the same—she holds the health of the household in her hands.

This being the case, surely the very first and most important study in a girl's education is the study of the laws of health. If

¹From the *Sanitary Record*, London.

here are obligatory standards to be attained in all schools, surely this should be the chief subject required. I can imagine a girl knowing nothing of the rule of three, and being an excellent mother of a family. And, after all, it is one of the duties of the State to fill its borders with healthy, well-grown subjects. We are often told that crime accompanies a sickly or diseased body, and we are also told that extremely highly educated and intellectual women produce puny children of low vitality. Instead, then, of cramming our girls with useless and difficult subjects of study, let us teach them more about the structure and requirements of these complicated machines we call our bodies. What food should be consumed to keep the internal fires burning, and to diffuse the necessary amount of heat. What exercise should be taken to use up excess of heat, and to keep the joints oiled and the muscles firm. How much air and water we must use to purify these bodies of ours, continually emitting so much deadly poison, that a thin coating of wax all over would cause us to die in the agonies of blood poisoning in a few short hours. How many hours sleep should be allowed to have dominion over us to repair mental and physical waste. Truly, these bodies of ours are fearfully and wonderfully made, and are worthy of the study and attention of even the most advanced girl graduate, particularly if some day she is called on to be the centre of a home, the heart and soul of a little community of citizens and workers in this ignorant and suffering world.

Inebriety Among Women.

The *British Medical Journal* gives a startling picture of the increase of inebriety among women in England and also in other parts of the world. The number of women convicted of drunkenness in England and Wales, rose from 5,673 in 1878, to 9,451 in 1884. Last year 35,000 females were convicted of drunkenness in the United Kingdom. In London in one year the increase of convicted women was 500. In Glasgow 10,500 women were sent to prison. Of this number 450 were sent to jail from six to thirty-four times during the year. In Ireland the champion female inebriate record-breaker has been arrested over 700 times, and she is only forty years of age. In this city about 10,000 women are arrested yearly for drunkenness.

THE ANNALS

OF HYGIENE.

The State Board of Health is not responsible for anything appearing in this Journal except that which bears the official attestation of the Board.

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EDITORIAL

All subscriptions to "THE ANNALS OF HYGIENE" are taken "until ordered discontinued," and no agent has authority to make any other arrangement. At end of time to which subscription has been paid or promised, a bill for a year in advance, with return envelope is sent, and if journal is no longer wanted, all a subscriber has to do is to mark "Discontinue" on the bill and return to us. A failure to return bill is considered an order to continue.

Federal Quarantine.



R. J. H. McCLELLAND, of Pittsburg, is a member of the State Board of Health of Pennsylvania and he is an observant sanitarian, who, as the result of a recent extensive tour in, and careful observation of, the sanitary administration of European countries, thus formulates his views on quarantine:

First.—His observation of quarantine administration in foreign countries (extending over most of the countries of Europe and Northern Africa), would lead him to question their superiority over our own, with the single exception of the advantages secured by uniform administration, under strong general governments. In most countries of Europe, notably England, quarantine supervision is weak and inadequate, only rising to an occasion such as a serious cholera outbreak offers.

Second.—The present status of quarantine administration in the United States is far from satisfactory, because of a lack of uniformity, which must inevitably obtain where authority is divided up among municipal governments.

Third.—This system (or want of system), existing in the United States, leads (a) to increased cost, an assertion easily substantiated; (b) increased interference and restrictions to travel, each representative of a separate government having to be satis-

fied; and (c), making strong probability of less security in the end, owing to misunderstandings where authority is divided.

Fourth.—All of which leads him to declare unequivocally in favor of a quarantine under national administration. Leaving to others the discussion of the effects upon imposts and commerce, it seems to him plainly and broadly within the province of the national government to deal with a procedure so distinctly international. Quarantine regulations and questions arising therefrom must inevitably provoke negotiations between foreign powers and home government, and nothing short of the diplomatic and consular service will suffice for such international dealings. It seems almost absurd to ask foreign governments to open negotiations with this or that municipality.

There are questions of health, sanitation and even quarantine which may arise between States, and which may well occupy the attention of State authorities, but his experience in connection with the Health Department of this State only confirms his belief in the necessity for adequate quarantine regulations under national authority. The quarantine laws of the United States should be administered by the government of the United States.

Finally, there should be prohibitory regulations against trade and immigration *in toto*, from districts permanently pestilential; as, for example, where cholera has its habitat. We legislate against the Chinese; better legislate against pestilence.

The Effects of Civilization.



SOME reflections on the effects of so-called civilization are suggested to our minds by the very cold weather that we are experiencing this winter. For four days last month the editor of this journal was, in company with many of his readers, "frozen up;" that is to say, he was without running water in his house, and the amount of discomfort occasioned by this fact was extremely great, but only so because of that which custom had made practically a necessity. In the days of our editorial grandfather, water carried into the house in pipes was a luxury undreamed of, yet our respected ancestor was certainly as happy and contented as we are, and he never suffered the inconveniences of a "freeze-up."

Does not so-called civilization bring with it conditions that

become such necessities as to cause us displeasure and unhealthy discomfort when they are denied to us?

Does a sixty-mile-an-hour express make us any happier or healthier or more contented than is this little Algerian boy with his motley donkey-ox-horse team? We think not; but, of course, we recognize that progress is the order of the day and we do not intend to butt against it.



THE ALGERIAN'S JOURNEY TO LONGEVITY.

We cannot, however, but feel that the effects of civilization, as the word is viewed to-day, is to create a lot of unnecessary necessities (if we may be excused the Hibernianism), the inability to gratify which is a great source of ill health and early death. Certainly contentment is one of the greatest aids to good health and longevity, and surely no one could be more contented than evidently is this little Algerian boy, who, should he be brought under the influence of modern civilization, would soon become a victim to a desire for the unattainable that would make him as miserable and discontented as are so many of our so-called civilized fellow countrymen.

The Annals of Hygiene

A Mohammedan Custom.



OUR illustration depicts a custom that is observed in Mohammedan countries. The question has occurred to us whether it did not have its origin in a sanitary principle.



A SANITARY CUSTOM.

We all know that nature designs that we shall breathe through the nose, and this she does for two reasons :

First.—The air is thereby warmed before it reaches the lungs.

Second.—Disease germs, floating in the atmosphere, are caught and held by the moist lining membrane of the nose, from which they are discharged when we blow this organ.

May it not be that these so-called benighted followers of Mohammed might have originated this custom of covering the mouth and nose when on the street in order to still farther enhance the efficacy of prevention afforded by nose-breathing. Be this as it may, while we cannot hope for the universal adoption of this pagan custom, nor do we ask for it, yet we are quite sure that such a protection to the lungs in these cold days of winter will do much to save the integrity of these vital organs. Particularly would we advise an imitation of this Mohammedan custom for the aged and for those whose lungs are not very strong.

Chicago Mortality.



WITH the eyes of the whole world turning toward this city, the tables of mortality in Chicago for 1892, compared with 1891, compiled at the Department of Health, will prove interesting reading. The complete figures up to the second week in December of last year are given. For purposes of comparison the death rate in the large cities of the country was tabulated from the records. The result shows that Chicago is one of the healthiest cities in the New World, and although the reports of the London Department were not at hand, Commissioner Ware and his assistant believe that the death average of Chicago will compare favorably with that of the first-named city, which is claimed to be the healthiest, as it is the largest, of all the cities in the world. The total of deaths in Chicago in 1892, with the last two weeks of December, is 26,073. In 1891 27,754 persons died, a difference in favor of the present year of 1,681. The heaviest mortality was in the months of January and August. In the case of the former month the results were due to a prevalence of lung diseases and typhoid fever. The last amounted to little as compared with the first, and these diseases were in many instances complications of *la grippe*. The ravages created by this disease are traceable in the heavy mortality shown for March, April and May, 1891. The recurrence of the malady last winter and spring was of a milder type. The

decrease in the death rate in February and thence on through the spring months was marked and steady. Save during October and November it falls to the lowest point of the year in June, but is swollen by nearly 900 in the month of July. In July and August 400 children died of cholera infantum. Eighty persons were killed by sunstroke in the same period. The deaths for the two months are in excess of those in July and August, 1891, but on the other hand the mortality is shown to be less in the subsequent months of 1892. The table showing the monthly percentage of deaths in the larger American cities, brought down to the last reports, is a strong testimonial to the healthfulness of Chicago. It indicates that, except in the months of January and February, the mortality of the city was the lowest of any city on the list. In January there was a slight difference in favor of Brooklyn. In February the average in Boston was a little below Chicago.

The Heating of Our Homes.



THE extremely cold weather that has recently prevailed so extensively throughout the land, would seem to make particularly appropriate, at this time, a few words of reply to the following query received from one of our subscribers :

"It will be agreeable to me to have any information which you can send me concerning the relative merits of heating in residences by hot water, steam and hot air, and also to state if it is not a fact that a great many first-class architects are recommending hot air, if properly constructed and put in, as being as good as any, and not deleterious to the general health of the inmates of the house."

We would premise our remarks by saying that we are fully alive to the fact that, no matter what views we may enunciate, we will find those ready to controvert them and to offer plausible arguments for their objections, because there are so many patented inventions for heating, each claiming superiority over the other, and each possessing salaried advocates of its merits, ready primed with objections against all systems and methods save that particular one which they are paid to advocate. Even architects, with all respect to them, are not always free from pecuniary bias in their recommendations.

What we say we say not as special experts in heating, not as advocates, in any way, of any particular method or system,

but as "all-round," utility sanitarians, taking an unprejudiced and uninfluenced view of the situation.

Observation convinces us that in very cold weather no form of heating is so satisfactory as steam, but steam heating does not provide for ventilation, and it consumes the moisture of the atmosphere. To our way of thinking, the perfection of heating for cold climates would be with steam, with separate and efficient provision for ventilation, and with water tanks on the radiators so as to provide moisture for the atmosphere.

With hot air furnaces, properly arranged, ventilation is provided for so far as the ingress of fresh air is concerned, and the humidity of the atmosphere is not destroyed.

What we have said of steam applies, practically, to hot water. Hence, to formulate, we would say :

First.—In very cold climates steam heat, with separate ventilation and provision for moisture, is to be preferred.

Second.—Where the cold is not so great hot air furnaces answer very well.

Finally, in conclusion, for ourselves we would give the preference to steam, did there exist no reason why we should not do that which we would prefer.

Cholera and Quarantine.



IF we are to have a quarantine at all, it seems to be strongly the sentiment of those qualified to speak that such quarantine should be under federal supervision; but it is fair to state that there are good authorities who do not place much faith in quarantine at all. For instance, the Illinois State Board of Health, at a meeting held in Chicago on the 28th of last December, declared that, in its opinion, attempts at quarantines of exclusion show that such quarantines, even though enforced by sanitary and military cordons, have failed in their object. It is not believed that an attempt to prevent the introduction of Asiatic cholera by prohibiting immigration would prove practicable. If such an attempt be made it should not be allowed to cause any neglect of other and approved methods of guarding the public health. With this latter idea we are heartily in accord. We believe in Federal quarantine, but we believe even more strongly in universal internal sanitation.

Disinfecting Vans.



THE disinfecting van, which we elsewhere depict in this issue, is very satisfactory in its working, writes Dr. Wingate. There are no patents connected with it, and the doctor will be always ready and glad to give any and all information in reference thereto that may be desired. The Health Commissioner of Chicago is having one built for use in that city. The idea seems to us a good one, well worthy of imitation.

NOTES AND COMMENTS

The Prevention of Consumption.

Dr. Walter F. Chappell very wisely (in *The North American Review*) calls the earnest attention of the public to the urgent need for greater supervision of hotel rooms and other accommodations for consumptives at health resorts, and he urges physicians to carefully instruct their patients in proper and efficient methods of disinfection.

Poisonous Finger Nails.

The popular notion that a scratch by the finger-nail may poison the one who is scratched, receives scientific confirmation, not because the nails themselves are poisonous, but because recent investigations in Vienna have found no less than thirty different kinds of micrococci hidden away in the dirt beneath the finger-nails. Clean finger-nails are much more important from a sanitary, even, than from an æsthetic point of view.

The Tomato.

The tomato was cultivated in Europe as early as 1554; it was known in Virginia in 1781; in 1798 a French refugee from San Domingo introduced it in Philadelphia; an Italian painter introduced it in Salem, Massachusetts; it was used as an article of food in New Orleans in 1812; it was first sold in the markets of Philadelphia in 1829, but did not come into general use in the North until several years after this last date.

The Danger of Contagion from a Body Dead of Typhoid Fever.

A very practically valuable point for health authorities is that given by Karlinski, *Zdrowic*, Varsovie, who claims to have demonstrated that the germ of typhoid fever lives only three months when buried in the earth, from which we might infer that a typhoid victim might be safely disinterred after an inhumation of three months. We give this observation for what it is worth, though we feel that we are yet lacking reliable information as to the longevity of disease germs.

Garbage Boxes in Memphis.

A regulation garbage box is to be established. It is to be a water-tight wooden box, eighteen inches broad at the top, sixteen inches deep, twenty inches broad at the bottom and covered with a close-fitting lid. Those who have ashes will be required to keep two boxes—one for ashes and one for garbage. The ashes can be utilized for filling broken places, washouts or other holes in the streets. The contents of the other boxes will be taken to the dump. While these boxes are to be made in accordance with the regulations and requirements they may be made by anyone. Each individual needing them can make his own box or hire it, as he deems best.

For the Suppression of Tuberculosis.

A law to suppress tuberculosis, especially in milch cows, was enacted by the last New York legislature. In general, the law authorizes the health inspectors to examine all the cattle in the State, and, when the disease is found, to cause the animal to be killed. The owner will be reimbursed for the actual value of the cow. The plan of carrying on this inspection has not been decided upon. An appropriation of only \$5000 has been made for the purpose. The dairy statistics of the State show that milk production is the largest industry in the State, and that it is greater than that of the milk production of all the other States put together. There are 11,600,000 milch cows in the State. The farmers sell to New York City \$11,500,000 worth of milk, and to the people of the whole State \$40,000,000 worth.

Two thousand and seventy-eight persons die every week in London. During the influenza epidemic this number rose to 3271.

Oxygen for Delicate Children.

We all know that oxygen is the vivifying element of the atmosphere, that oxygen is a promoter of tissue change, and that continuous tissue metamorphosis is essential to healthy life; hence are we prepared to receive favorably the suggestion of Dr. Gonzales Alvarez, of Madrid, who recommends the inhalation of oxygen to freshen up the vitality of debilitated children. Now-a-days, when you can order a cylinder of oxygen sent to your house, and since it cannot do any harm, we would advise parents whose children are not as "hearty" as they would like to try these oxygen inhalations.

Borax in the Household.

The box of borax should be as much in place in every household as the salt box, or the jar of salve for burns. It is one of the best agents for softening water for domestic uses. There is no greater comfort for any one on a tour, traveling in a limestone district, than a small box or packet of borax; for by its use the effects of hard water on the skin are quite neutralized. It may be used either as a substitute for or in conjunction with soap, the proportion being a handful of borax to nine or ten gallons of water, and it has the advantage over soda of not spoiling colored clothes. In the laundry borax is used for washing laces and fine things and in the making of cold starch, and for giving an additional glaze to collars, fronts, cuffs and starched fabrics generally. As an insecticide it is invaluable; cockroaches will not haunt a kitchen where borax is scattered on the floor, and it is harmless to domestic pets. Scientists say that a very small proportion (one in 1000) is enough to retard the souring of milk for twenty-four hours, and that this amount is not injurious to health. Mixed with glycerine it forms one of the most generally used applications in throat affections; in cases where glycerine is disliked, honey may be substituted. Lastly, borax is in itself a valuable disinfectant and antiseptic, and is a component part in many dental preparations.

THIOCAMF presents a ready way of using sulphur dioxide as a disinfectant. He says a combination of camphor and sulphurous acid presents the germ-destroying agent in a very concentrated and convenient form.

A Ministry of Public Health.

Scotch sanitarians are now strongly urging the centralization of sanitary authority, and are urgently decrying optional sanitary legislation. Both Scotland and England are urgently clamoring for a Ministry of Public Health. The French Workman's Sanitary Congress, recently held in Paris, entertained similar views, all of which causes the *Lancet* to conclude that the day is not far distant when in every civilized country there will be a Ministry of Public Health. Let us earnestly hope that our own progressive country will not be slow to adopt this most desirable innovation.

The Success of Quarantine in New York.

Representatives of fifteen lines, forming the Transatlantic Steamship Association, met at 19 Broadway, and adopted these resolutions:

WHEREAS, Dr. William T. Jenkins, Health Officer of the port of New York, and his staff have, in our opinion, by their energy and devotion to duty averted an epidemic of Asiatic cholera that threatened not alone this port and city of New York, but also the entire country; and

WHEREAS, We consider the work of quarantine was and is conducted with a view to the least possible interference with business interests and travel, so as not to inconsistently obstruct or injure commerce; and

WHEREAS, We consider the different shipping interests of this port have been treated with impartial fairness; and

WHEREAS, The Hon. Chas. Foster, Secretary of the Treasury, and the officers of the National Government acting under his direction aided in this noble work; be it, therefore,

Resolved, That the hearty commendation of this association be and is hereby given to Dr. William T. Jenkins and his staff, and to the Hon. Chas. Foster, Secretary of the Treasury.

From July 31 until October 21, 1120 vessels passed through quarantine, carrying 96,344 persons, who were all examined by the health officer and his corps of assistants. Of this great number of persons 20,187 were first cabin passengers, 16,145 second class, 19,270 steerage passengers, and 40,742 officers and crews.

SALT and vinegar will clean the mica in stove doors.

Treatment of Cholera.

The famous elixir of Voronej, widely used in Russia, is composed of the following ingredients:

R. Ammon. muriat.....	3x	
Olei naphthæ.....	3vj	
Olei caryophilli.....	3x	
Acid nitric.....	3vj	
Potas. nitrat.,		
Turkey pepper.....	āā 3 iss	
Menth. virid.....	3 viij	
Aceti.....	Oj	
Spirit. vini gallic.....	Oiv	M.

The Quack Question as Handled by the City Council of Mansfield, O.

At a meeting of the Council of the City of Mansfield, Ohio, on November 29, 1892, an ordinance was passed by a two-thirds majority which prevents any quacks or itinerant venders of medicine, "tooth-pullers" or other impostors practicing their nefarious schemes in that city without first getting a permit from the health officer, who, by the ordinance, is required to be a regular physician. The ordinance also requires these quacks to display a diploma from some reputable college before the health officer can give them the necessary certificate entitling them to a license at all. On the presentation of said certificate to the Mayor they can receive a license for which they must pay not less than \$25 nor more than \$50 a day, and are also subject to a fine of not less than \$25 nor more than \$50 for each and every offence for the violation of this ordinance.

The law goes into effect immediately after publication, and covers physicians, midwives, pharmacists and dentists. If every city council throughout the United States would follow the example set by the council of Mansfield they would take a grand step in the direction of getting rid of quacks and impostors who infest all our large cities. This plan has been tried in Kentucky, and so far has proved to be of great advantage in getting rid of these leeches, and should be followed by all the States that have no special laws, or that cannot get special legislation to remedy this great evil.

MARION HARLAND says: "The foundation of a happy home is laid in the kitchen."

Decreasing Virulence of Cholera.

The history of Asiatic cholera on the North American continent during a period of sixty years past conclusively demonstrates that its duration, virulence and mortality have diminished with each successive epidemic, says the Illinois State Board of Health. Recent advances in sanitation and in the knowledge of this disease have made it practicable to deal with a cholera outbreak more promptly and more certainly than with that of any other epidemic disease. From the foregoing considerations Asiatic cholera has for the sanitarian ceased to be a factor *per se*, as affecting the public health, but derives a fictitious importance from its sensational exploitation in the public press, aided and abetted by the timidity and ignorance of a few poorly equipped health officers and members of the medical profession.

How They Buried Cholera Cases in Hamburg.

In the streets of Hamburg the funerals, as many as 300 in a day, became an inevitable feature. The Vienna doctors watched some carriages driven by in which the occupants had from one to three children's coffins on their knees or in the bottom of the vehicles between them. In some favored cases there was a hearse and a carriage or two with the mourners, but never did they see a person who accompanied the dead crying. Either the Hamburgers were already hardened to grief, or the mourners were not the near friends of the dead.

But by far the majority were not taken to the churchyard in this manner at all. Notice was given that a person had died in a house. An ambulance car, improvised out of an ordinary tradesman's cart, which was making the rounds, stopped at the address when it passed that neighborhood. Sometimes this was at night, the patient having died in the morning. The body was heaved into the cart, the door slammed, and the cart went on its sad journey again. There was nobody to be shocked or sorry at this treatment, as the family of the dead were sure to be standing round the bed of a new sufferer.

DON'T think that an occasional or even regular practice of gymnastics is enough to correct defects of frame and figure. You must *live* the principles all the time, in attitude, carriage, right breathing and nerve control.

Cholera as a Reformer.

Dr. C. A. Lindsley, the secretary of the State Board of Health of Connecticut, who always says something every time he opens his mouth, very truly observes that the most notable movement in matters concerning public hygiene which has happened for many years, is the recent simultaneous effort in almost every town and city and village to be clean. With a general approval, which has never before been so nearly unanimous, sanitary inspections have been systematically undertaken from house to house. Streets have been cleaned, privy vaults and cesspools have been emptied, the back yard garbage heaps have been removed, the purity of water supplies investigated, and better drainage provided.

This very meritorious attempt at reform has not been local in any sense. Not only in Connecticut and throughout the United States have efforts to this end been more or less active and energetic, but in every city in Europe there has been a sudden and general conversion to the faith of the sanitarian, and a hasty and practical adoption of his creed, that in cleanliness there is safety.

The great apostle of hygiene in this reformation is the cholera—cholera is a practical preacher, and demonstrates its doctrines by its works. Wherever it finds a people disregarding the lessons it has taught before, it wastes no time with argument—it simply kills them.

Europe and America both have had repeated teachings of this sort, and are wise in making the lessons practical—it is to be hoped they will not be too tardy or too negligent in obeying the behests of this uncompromising, arbitrary and pitiless instructor in nature's laws of health.

Cholera has been very aptly called the great sanitary inspector of nature. When gregarious man too openly defies the laws of health, and wantonly falls into beastly habits of filthiness, the cholera starts on its inspecting tour, and inculcates the laws of healthy living with a decision and emphasis that is best measured by the graves it fills.

Cholera is the author of sanitation, and notwithstanding the destructive energy with which it acts, it has been a benefactor of the human race, having saved more lives by the reforms it has produced than it has destroyed.

SINCE 1875 England has spent about \$43,550,000 in sanitary works.

THE Austrian authorities have issued a rescript calling attention to the law that physicians' prescriptions must be written in a legible hand.

DR. DUNCAN MCLEOD has been appointed a member of the Detroit Board of Health, in place of Dr. E. A. Chapoton, who has resigned.

A CALIFORNIA QUACK makes the somewhat rash promise that he will pay half the funeral expenses in cases where he is "not successful."

SPECIAL REPORTS

State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania.

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S. T. DAVIS, M.D., of Lancaster.

HOWARD MURPHY, C.E., of Philadelphia.

BENJAMIN LEE, M.D., of Philadelphia.

PLACE OF MEETING,

Supreme Court Room, State Capitol, Harrisburg, unless otherwise ordered.

TIME OF MEETING,

Second Thursday in May, July and November.

The New Jersey Sanitary Association.

One of the most satisfactory and successful gatherings of sanitarians that we have ever attended was the Annual Meeting of the New Jersey Sanitary Association, held at the Laurel House, Lakewood, N. J., December 9 and 10; successful and satisfactory, because of the fifty and more who were present at the sessions, the majority were men distinguished in their special avocations, and as the natural and to-be-expected, result of this fact the suggestions emanating from them were of a useful and practical nature.

THE HIGHLANDS OF NEW JERSEY.

Those but slightly acquainted with the topography of New Jersey have

the vague but erroneous idea that it is a flat, sandy country, devoid of any high land. State Geologist Smock (whose paper we expect to publish in full) thinks that the Highlands of New Jersey constitute a region that might become classic in climatology; the region is so small and compact that numerous observation stations could be readily equipped and maintained, and Dr. Smock thinks that accurate and careful meteorological observations are all that we now require that we may deduce climatic laws. The hill towns of New Jersey are noted for their salubrity. The conclusions of Dr. Smock are that the highlands of New Jersey offer a location convenient to the large cities of New York and Philadelphia wherein all the natural conditions that are necessary for the healthy life of man are to be found.

THE PINE BELT OF NEW JERSEY.

We would supplement the paper on this subject that was read by Dr. I. H. Platt, of Lakewood, and which we published in our last issue with our own impressions of this Aladdin-like winter "Health Resort. Twelve years ago, what is now Lakewood, with its national reputation as the winter home of the Democracy, was the Jersey village of Bricksburgh, containing, all told, about 100 houses, of the kind usually found in Jersey villages. To-day one finds probably the handsomest, best appointed and best managed hotels in the world, dropped down, as if by magic, amidst the "pines." If there was nothing else, it would be worth a visit to Lakewood to see its hotels. But there is something else, for the controlling powers of this resort are fully alive to the importance of sanitation and they have, in an ingenious way, provided for the purity of the water, the removal of sewage and the destruction of garbage, the three prime requisites for the health of a community.

THE REQUISITES OF A HEALTH RESORT.

Dr. H. Mitchell, of Asbury Park, presented a most valuable paper, which we publish elsewhere (see page 77), but the essence of which was that no matter how much nature may have done for a locality, the neglect of man may nullify such blessings, and he truthfully says that "Health Resorts" are made and maintained by the physicians, and he predicts that the time is not far distant when the physician will demand that such places as expect his commendation and support will be obliged to accurately represent their sanitary condition. We have always maintained that insurance companies place too much stress upon family history and too little upon the life habits of the individual, and so we believe that the public and the profession rely too much upon natural and too little upon human agencies in the production of "Health Resorts." New Jersey is now a huge sanitarium, dotted here and there with these resorts, and we hope, in keeping with Dr. Mitchell's idea, that a lively competition will be inaugurated between them to see which can the soonest approach that degree of sanitary perfection in administration that we have a right to demand, and that we will come soon to insist upon in any place claiming professional endorsement as a "Health Resort."

A LAKEWOOD ENTHUSIAST.

Dr. Stone, of Lakewood, a gentleman whose appearance gave evidence of his intelligent ability to form such an opinion, was enthusiastic as to the

wonderful effects produced in himself by a residence at this place. Six years ago he was obliged to leave New York, full of malaria, a victim of insomnia and a nervous wreck; now, he says, he is a well man, and his appearance fully bears out the assertion.

ANALYSES OF THE ATMOSPHERE.

Dr. Albert R. Leeds, of the Stevens Institute of Technology, at Hoboken, calls attention to the fact that the atmosphere is a much more complex affair than is commonly realized. The atmosphere contains not only hydrogen and oxygen, but ozone, peroxide of hydrogen, nitrates and nitrites, dust particles and an incredible number of germs. Any study of climate that does not recognize this complex nature of the atmosphere is very imperfect, yet, up to the year 1876, Dr. Leeds is unable to find that any analysis of air had ever been made in this country. Ordinary meteorological observations, such as relate to temperature, humidity, wind velocity, barometric pressure, etc., may be good enough for commercial purposes, but they are not sufficiently far-reaching for the uses of hygiene. Investigation of the organized germs of the atmosphere would form a basis for scientific medical climatology.

Dr. D. Benjamin, of Camden, strongly endorsed these views.

THE PROGRESS OF SANITATION IN NEW JERSEY.

Dr. E. L. B. Godfrey, of Camden, the president of the Association, in his annual address reviewed in a masterful and eloquent manner the history of sanitation in this model little State, from the passage of the first law relating to sanitation in 1799 (which gave to the Governor plenary powers when the officers of vessels endeavored to evade the quarantine laws of New York and New Jersey), down to the present time. We publish elsewhere Dr. Godfrey's address in full.

PHYSICAL CULTURE.

Capt. T. D. Landon, of the Bordentown Military Institute, read a paper on "Physical Culture" (which we will publish in our next issue), and in the discussion which followed our heart was made glad by the eloquent and glowing argument of the Hon. A. B. Poland (State Superintendent of Public Instruction of New Jersey), that there is much sham in so-called "systems" of physical culture. Here was an intelligent and practical educator, a man who evidently knew what he was talking about, and who had "no axe to grind," stoutly claiming that instead of "systems" we should teach our children to sit, stand and breathe correctly. We have always felt that if a person would cultivate the habits of correct sitting, standing and breathing (with all that this implies), and walk five miles daily, rain or shine, they would therefrom derive all the physical culture that is essential to health. Mr. Poland is the first person whom we have ever heard allude to the truly fallacious idea that hard muscles are not necessarily healthy muscles, and that it is not necessary for one to harden his muscles in order that he may be healthy.

Dr. H. B. Boice, of the State Normal School, thinks that there are very many so-called physical instructors who, because of charlatanism, really do

a great deal of harm. Dr. Boice believes more in the efficacy of an erect carriage and a capacious chest than in the use of gymnasia.

Captain Landon, while decrying "systems," thinks that if one is wanted the military system meets all requirements.

It seems that in New Jersey no person can receive a license to teach without first passing an examination on physical culture.

Dr. D. Benjamin, of Camden, thinks that every school should have a physical instructor, who should examine every pupil, not for the purpose of ascertaining those best fitted for contests, but to ascertain the physical needs (and supply them) of each individual child.

SCHOOL ARCHITECTURE.

George W. Debevoise, of New York City, who has built forty-one public school houses, of an average cost of \$200,000 each in that city, made some extremely interesting and practical remarks on this subject. As to location, very often the site for a school-house is selected because it cannot be used for any other purpose, when, by "wire-pulling," it is disposed of at a fancy price. School-houses should always be located on corners, and the southwest corner should be chosen, because the front of the building, which is best prepared to resist our severe storms, will thus face northeast, and most of our severe storms come from this direction. The building should always be fire-proof, and we should be always guided by the maxim that "nothing is too good for a school-house." In cities the roof should be so arranged that it can be utilized as a playground, and the sanitary conveniences should be here located. The building should never be more than three stories high, and there should be a cellar under the whole of it. The floors should not be made of maple, which becomes very slippery, but of cone-grained yellow pine, the life of which is as twenty-five to five years when compared with ordinary pine. This floor should be laid in pitch or asphalt, and each board should be only three feet long, the joints filled in with pitch; such a floor will have no cracks for dust, for all cracks should be filled with putty. Stairways should be double, with landings in common; they should be built in brick apertures and should be fire-proof. Class-rooms should be twenty-four feet deep, twenty-six feet wide and fourteen feet high in the clear, and such a room should accommodate forty pupils. The window space should be equal to 30 per cent. of the floor space, rather than only 20 per cent., as the German custom demands. In some of his schools he has as much as 38 per cent in glass. There should be no wood, except the floor, in any school-room; the door and window-frames and the wash-board should be of slate, as also the sills. There should be no projecting cornices, nor any projections of any kind for the reception of dust. Schools are generally infested with vermin and we should not furnish them a harbor. The walls should be colored a neutral tint, and should be of the hardest plaster. All class-rooms should communicate, and each should open into a large corridor. To deaden sound the author uses two floors laid diagonally in opposite directions, between which he inserts four thicknesses of two-pound felt.

Prof. J. M. Green, principal of the State Normal School, thinks that all school plans should be submitted to some competent constituted authority, not necessarily for revision, but, at least, for criticism. If the people would

let their representatives know that they want good school-houses they would get them, for he naively remarks that politicians are not anxious to oppose the people.

Supt. V. L. Davy, of Orange, who is chairman of the committee to arrange for New Jersey's educational exhibit at the World's Fair, laments that there are very few school-houses in the State models of which he would care to send to Chicago. There are many old wooden buildings that ought to come down, and skilled school architects should always be employed to erect school buildings, but this has not been the custom in the past. While Mr. Debevoise wants one-third of the floor-space in windows, Mr. Davy complains that very few schools have one-sixth. Steam-heat should never be used in schools; the blackboards should be of slate, should come down to within eighteen inches of the floor, and the ceilings should never be higher than thirteen feet. The school-rooms at present average twenty-one by twenty-five feet; he would like them to be twenty-five by thirty-two, and to contain each forty pupils.

ARCHITECTURE IN RELATION TO SANITATION.

Arnold Moses, Esq., of Merchantville (whose paper we will publish later on), wisely suggests that the architect could do much to farther the cause of hygiene if he would make it a rule to always impress upon his client the importance of sanitation.

George P. Olcott, C.E., of East Orange, thinks that too little is said about the cellar. If your cellar is built right you need not fear cellar air.

SUPERVISION OF PLUMBERS.

Dr. Henry Mitchell, of Asbury Park, thinks that we should not trust the plumbing work of our dwellings to the unsupervised work of plumbers; there are honest plumbers, he thinks, but not many; though to be fair and charitable he would rather incline to think that plumber's defects are due rather to ignorance than to intentional deceit on their part. The Doctor claims that while plumbers are apt to sneer at the suggestions made by doctors, and to think that they are impractical men from whom nothing practical can be learned, that the plumber will do well to heed the suggestions he may receive from physicians. Why is it, said the Doctor, that plumbers do not take hold themselves and elevate the standing of their trade? why do they not so organize as to give the public a confidence in their work? Mr. Francis, the plumbing inspector of Camden, thinks that a plumber who sneers at the suggestions of a physician makes a great mistake; as a plumber he admits that he has received many valuable suggestions from physicians. Mr. Francis advocates simplicity in plumbing, and he believes in having a trap on the soil pipe at the curb; it is an additional precaution that, he thinks, can do no harm. There are many who object to this trap at the curb, but, he thinks, this objection is due to the fact that this trap is generally given a cant outward by plumbers; this cant destroys the seal; the trap should be laid level. Dr. Keyser, of the Philadelphia Board of Health, remarked that his Board had adopted a rule forbidding the use of varnished pipes, or pipes coated with coal-tar, for drainage purposes, because such coating will conceal minute holes in the pipes and ultimately break-away, will allow these pipes to leak.

Dr. Githeus, of Asbury Park, lays the blame for bad plumbing rather upon the people than upon the plumber, and we are inclined to endorse his views, for, in most cases, we believe that if the people asked for and were willing to pay for good plumbing they would get it. Carroll Phillips Bassett, the eminent civil and sanitary engineer, of Orange, does not favor curb traps where there is a good system of sewers, so designed that they are likely to keep clean, but when the soil pipe terminates in a cesspool or in badly constructed sewers this trap may be used. Mr. Bassett wisely and conservatively says that we cannot speak dogmatically on this subject of curb-traps, but that each individual case must be a study in itself.

MILK ADULTERATION.

In the discussion of the paper by Dr. Leeds (see our last issue), State Dairy Commissioner McGuire stated that, owing to the system of inspection in vogue, the wholesale adulteration of milk in New Jersey that was once the rule had become a thing of the past. He differs from the ordinarily accepted view that adulteration or dilution by water is only a commercial fraud, because it debases the nourishment of children and, if foul water be used, it is very provocative of disease.

Dr. E. O. Shakespeare, the port physician of Philadelphia, claims that impure milk is much more to be dreaded than the cholera. He thinks that it is one of the greatest needs of the day to create a wide-spread public sentiment on this subject. Dr. Shakespeare would like to raise the legal standard of solids in milk to 13 per cent.

TUBERCULOUS CATTLE.

Dr. Miller, the chief inspector of meat for the Government at Philadelphia, presented the organs of a cow that were full of tubercles, said cow having been milked, and the milk sold up to the very day of slaughter. Dr. Miller says that he rarely finds tuberculosis in western cattle, but that it is very common in the cattle received from the neighborhood of Philadelphia for slaughter, and the flesh from which is used for "bologna meat." Tuberculosis is very common among milch cows.

Railway Sanitation.

[Dr. G. P. Conn, the chief Surgeon of the Concord & Montreal Railroad, is also the President of the State Board of Health of New Hampshire.—ED.]

SANITARY REGULATIONS OF THE CONCORD & MONTREAL RAILROAD.

For the purpose of preventing and restricting the spread of any contagious or infectious disease, and to provide as effectually as possible against the presence of any unhealthful or offensive conditions at stations, grounds or upon trains, the following rules and regulations are issued.

(1) All railway stations and grounds adjacent thereto must be kept in a cleanly condition. The waiting rooms, ticket offices, closets, etc., must be swept at least once a day. Store rooms, baggage rooms, freight sheds, etc., must also be kept clean, and the storage of substances liable to decomposition, such as green hides, fish, etc., must not be allowed in any passenger depot. In any combined passenger and freight depot they must not be allowed for a period of more than twelve hours, and if offensive they shall

not be stored there at all, but be immediately removed to some unobjectionable place.

(2) Water-closets and urinals at stations must be kept sufficiently clean to be free from offensive odors. They should be thoroughly washed at least once a day (urinals oftener in summer, unless automatically flushed) with soap and water, and, in addition, disinfectants may be found necessary with faulty fixtures.

Privies should be cleaned out often. Dry earth or freshly slacked lime should be used in the privy daily in sufficient quantities to prevent all odor; by this means a privy can be kept free from danger to the public health, and inoffensive.

(3) The water supply of the station must receive careful attention. If from a well near a station or dwelling-house, or anything liable to contaminate the water, its use must be prohibited until the condition of the water can be determined by analysis, and for that purpose a sample should be forwarded to the State Board of Health.

(4) The station agent at each station is hereby charged with the execution of the above rules, and will be held responsible for non-compliance, or for any unsanitary condition that may exist at his station, in the same manner as for the non-performance of other duties. Any person having cognizance of unsanitary conditions at any station should promptly notify the division superintendent.

(5) Water-closets and urinals in railway cars and coaches must be kept at all times clean and free from odors. At all points where cars are cleansed these fixtures must be thoroughly washed and disinfected, for which the parties charged with this duty will be held responsible. When in transit brakemen are charged with the duty of keeping such fixtures clean and inoffensive.

(6) Requisition for disinfectants may be made through the usual channel for supplies. Special instructions for the use of disinfectants will also be furnished. It should, however, be borne in mind that disinfectants are required only where complete cleanliness can not be secured without them. Disinfectants should never be used as a substitute for soap and water, but as an adjunct thereto.

(7) Division superintendents will frequently inspect the sanitary conditions of the stations, grounds, coaches, etc.; they are instructed to cause the abatement of any sanitary defects for which the road is responsible, as well as like conditions maintained by others detrimental to the interests of the railroad company and the traveling public. To the same end the co-operation of the division surgeons is requested.

(8) Station agents are required to keep a copy of these rules and regulations posted in the water-closets of their respective stations.

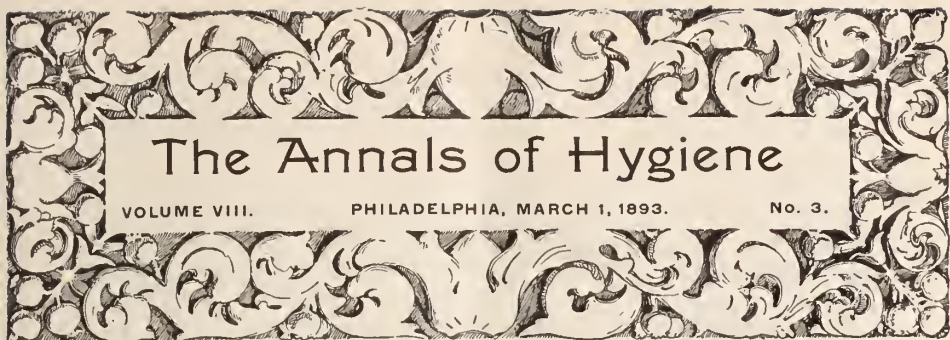
Conductors will be held responsible for the failure of their brakemen to keep the water-closets of passenger cars in a cleanly and inoffensive condition while in transit.

Per order

T. A. MACKINNON, *General Manager.*

Approved by the New Hampshire }
State Board of Health. }

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COMMUNICATIONS.

Training for Bicycle Racing.

BY SENECA EGBERT, A.M., M.D.,
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Lecturer on Hygiene, Drexel Institute.



HERE are certain important considerations that must always be taken into account by any one who contemplates entering any athletic contest, and bicycle racing is no exception to the rule. I am not one of those who believe that a man who is properly trained and prepared for the competition is endangering himself, no matter how

severe the effort; but there is a serious risk involved when any of the contestants are improperly trained, and there may be such injury engendered or developed as to greatly outweigh all the benefit and pleasure derived from the sport. In fact, I believe that an active interest and participation in any branch of athletics by one properly prepared therefor is entirely conducive to perfect health in after life, and to longevity rather than to a contrary condition; in support of which belief I may call attention to an article by Dr. J. Madison Taylor, of this city, on "The Influence of Bodily Exercise upon Length of Life."¹ In another place, also, the same authority says: "It may be accepted as almost an axiom that no instance of organic lesion is yet demonstrated to be the direct and sole result of bodily exercise or competitions in one adequately trained."² Moreover, I have an idea that the

¹ Journal of the American Medical Association, June 4, 1892.

² Lecture at the Franklin Institute, December 7, 1891.

highest records made by first-class athletes of to-day are more nearly what the normal man should be able to do, were he not rendered less vigorous by the social and sedentary exactions of his life, than are the averages even of those who lead out-door lives and comprize the various athletic clubs and associations. The reason why this is likely to be so is that few—very few—men have those qualities that insure success in an athletic contest, and at the same time have the self-control and determination to undergo the long and trying regimen of a correct system of training. Thus, when accidents do occur or latent maladies develop, the blame is thrown upon the sport, when it is really due to a faulty method of training or to the unfaithfulness of the sufferer.

One contemplating a season of bicycle racing should be, at least, 18 years of age—better 19 or 20—and before beginning work should be thoroughly examined by a competent physician, and be frankly informed of any latent weakness or developing trouble. Before 18 there should be no severe training, because for the three or four years previous to that age the body develops rapidly and needs all its vital force for the purposes of growth. However, if the youth has been devoted all his life to out-of-door sports and gymnastic games he will be all the better prepared for the hard work he is to undergo. Should the medical examiner discover diseased conditions or latent weakness, the exercise should be entered upon with caution and with a willingness to abandon it should it prove to be harmful. But many cases, both functional and organic, do materially improve under the regular and systematic habits enforced in the training, and owing to the active life in the open air. With organic heart disease, however, I should advise that speed contests should not be attempted under any circumstances.

The secret of successful training is to conserve all energy possible and then to be able to expend it at the supreme moment when every foot-pound of force is needed to win. Once this is thoroughly understood there should be no mystery or doubt as to what one ought to do in any particular case. But it is not sufficient to store up muscular energy alone; more important even than this is the development of one's nerve-force and will. It is comparatively easy, if sufficient time be given, to harden and strengthen the necessary muscles for any reasonable task, but to

be able to control one's self so as to subdue all trepidation, on the one hand, and undue ambition on the other, to have both body and mind completely under the mastery of the will, and to be



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calm and to know exactly what himself and his opponents are doing in the excitement of a race is far more difficult, and some-

thing not easily acquired. A person with a highly nervous and excitable temperament, therefore, will have to discipline himself more severely than one who is equable and phlegmatic, though the former may be more successful in the actual contest from his greater ability to summon all his power to his assistance at the critical moment. In this connection it is most advisable to study *pace*. It is wonderful how accurately a person may teach himself to judge and gauge his speed, some runners being able to go a given distance within a fraction of a second of a time previously announced; and it is always well to know just how fast you or your antagonist is traveling, and whether that speed can be maintained to the end.

The source of all energy developed in the body, whether muscular or nervous, being the combustion of food and tissues, it is essential that there should be as free a supply of oxygen as possible to maintain that combustion, and that every effort should be made to bring about an increase in lung capacity. Therefore, every proper system of training must include this pulmonary development, and it must be one of the first things to which attention is given. For developing the chest the exercises described by Mr. Edwin Checkley, in his "Natural Method of Physical Training," or those suggested by Dr. C. P. Linhart, physical instructor of the Manhattan Athletic Club, of New York, and given below, may be properly followed:

"Care should be taken not to go through the following movements directly after a full meal or after prolonged or violent muscular exercise. At such times they would produce dizziness or even fainting:

"*Movement 1.*—Stand erect, the head thrown back, the chin close to the chest. Gradually fill the lungs as full as possible through the nose, at the same time raising the shoulders up and back, about an inch above the natural position. This should consume ten seconds. Then allow the air to escape slowly through the nose, letting the shoulders resume their natural position, in about ten seconds more.

"*Movement 2.*—Begin the same way as in No. 1. After filling the lungs drop the shoulders back and down as far as they will go, holding the breath for five seconds. Then exhale, while letting the shoulders assume their natural position quickly.

"*Movement 3.*—Let the arms hang down by the sides, and gradually fill the lungs as in No. 1, at the same time raising the arms, extended at the sides, slowly, until the backs of the hand

touch above the head. This should take about ten seconds. Then exhale for ten seconds more, allowing the hands to fall slowly down again by the sides.



P. J. BERLO.
N. H. VAN SICKLEN.

A. E. LUMSDEN.
L. D. MUNGER.

"*Movement 4.*—Begin the same as in No. 3, and when the lungs are filled and the hands touch above the head, hold the

breath, and drop the arms quickly down at the sides. Exhale naturally after five seconds of holding the breath. This movement is especially adapted to narrow-chested people, as it will surely broaden such a chest.

"Movement 5.—Fill the lungs slowly through the nose in about ten seconds, at the same time slowly raising the arms, extended at full length in front of the body, until the hands are above the head and back of it as far as they will go without bending the back or knees. Then begin to exhale, letting the arms fall slowly down again in front, occupying ten seconds.

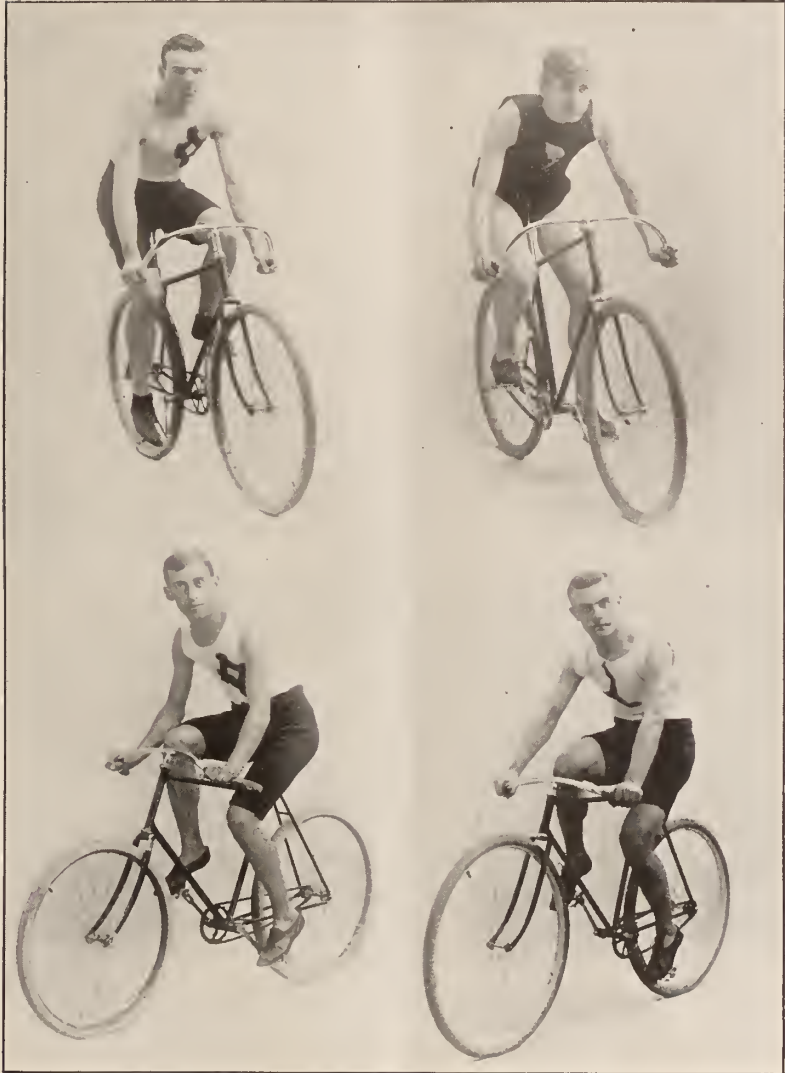
"Movement 6.—Begin as in No. 5, but when the lungs are full and the hands overhead, hold the breath for five seconds, and drop the hands quickly down in front. Then exhale naturally. This movement is particularly adapted to shallow-chested people as it will surely deepen the chest, that is, lengthen its diameter from front to back.

"Movement 7.—Gradually fill the lungs to their utmost capacity during ten seconds. Then forcibly exhale until all the air possible is driven out. Throw the shoulders forward at the same time. Let the air escape with a loud whistle or a hiss, or a long-drawn A-a-a-h!"

The point to be emphasized is that it is increased chest capacity that is most to be desired, though strong chest muscles are needed for forced respiratory effort.

As to diet, there is not the need that is commonly supposed that it should be greatly restricted either as to quantity or variety. Of course, the food should be wholesome, of the best quality and selected with respect to the body needs it is to supply. Moreover, it must be properly cooked, taken at regular and suitable intervals, and be thoroughly masticated, that as little energy as possible be wasted in its digestion and assimilation. It is well also to remember that nitrogen is a prominent constituent of all our tissues that manifest energy, and that our nitrogenous foods or proteids (meats) repair waste and restore tissues, and are to be used accordingly; while, on the other hand, we must look to the carbohydrates (starches) and fats as respectively force and heat producers. A slight amount of some mild stimulant, such as ale or porter, may be permitted at meal time, as digestion is thus facilitated; but large quantities must be absolutely forbidden, as they liberate far more force than they replace in the body, and also increase the heat dissipation, which is only a loss of energy in another form.

Owing to the increased elimination of water from the skin and lungs, a man in training must have a much larger quantity of fluid than usual, this quantity amounting to 100 fluid ounces



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C. W. DARNTAGE.

or more a day. About 20 per cent. of this will be taken as a constituent part of his food, the remainder as a beverage in some form

or other. The use of this increased amount of fluid is contrary to old training theories, but is based on strictly physiological grounds. Weak cold tea makes an excellent beverage for training, because it acts both as a nerve sedative and a mild heart stimulant, and oat-meal water will be found to be more refreshing and a better thirst quencher than water alone. As I have intimated, a small amount of some malt liquor may be permitted with the heaviest meal of the day. Whatever water is used should be pure; that is, free from deleterious substances and disease germs.

The hour of retiring should be a fixed and comparatively early one, and plenty of sleep must be had, as it is the great restorer of expended energies. Eight hours a day is none too long to pass in slumber and tranquillity. I may add here that most trainers agree that the night air is to be avoided, if possible, and that it is best for the one in training to employ his evenings at home in some quiet pursuit or recreation.

As to bathing, a cool bath once a day should be taken, not only to keep the pores of the skin open and clean to favor the increased elimination of waste matters, but also to act as a mild tonic to the whole system. For the first half of the training the bath may be taken on rising; later, after the exercise on the wheel when visible perspiration has ceased, but while the body is still warm and just before the rubbing by the attendant.

With the foregoing to guide us, the following sketch of a three months' course of training for a race may be of advantage, it being taken for granted that the rider is not at present "in condition." Meals at regular intervals, say at 6.30 A.M., 1.00 and 6.00 P.M. Retire at 10.00 P.M., and rise at 6.00 A.M. On rising, a bath as above and exercises for expanding the chest. For the first two or three weeks not much else except a little gentle riding, striving in the meantime to get the nerves under perfect control and to be always calm. For the next three weeks considerable riding to harden and strengthen the muscles and to accustom them to the work, but at slow speed, especially at first.

During this preliminary riding special attention should be given to the position, and every effort made to eliminate all awkwardness of action. Awkwardness means that power is being wasted through some muscles antagonizing others. I believe that the human body, in working to its greatest efficiency along lines of least resistance, will be always graceful and, other things being equal, the most graceful athlete will be the most successful. Above all, the back must be kept straight and the

shoulders well back, in order that the chest may not be contracted nor the lung capacity in the least encroached upon. This need not prevent some bending at the hips, though there should not be too much flexion even there, lest the blood supply to the lower limbs be lessened at the time when oxygen and food are most needed by the muscles of the thigh and leg.

With all awkwardness eliminated and a correct position acquired, attention should then be given to learning how to apply the most power to each stroke, and how to employ to their greatest efficiency the muscles of the trunk and arms as well as those of the legs.

The last five or six weeks of training should be employed in studying pace, and continuing the work of strengthening the muscles and developing the lungs. Zimmerman, the champion, says he rode twelve hundred miles this last season before entering a race. It is a mistaken idea that there should be much fast riding in training; an excess of this will be harmful rather than beneficial. Once, or at most twice, a week is often enough for speeding, and only short sprints should be attempted at first; that is, five or six weeks before the race, gradually increasing the distance afterward, but always going slower than your utmost ability, or than you expect to ride in the race.

After each day's exercise the rider should have his bath, if he has not taken it in the morning, and should then be well rubbed by an attendant. He will soon find that there is no liniment or lotion so efficacious or restful as the friction and massage of a good "rubber."

At the beginning of training one should endeavor to discover the distance and speed for which he is best adapted, and, having trained for a certain distance, he should not enter contests in which either the speed or the distance is much greater than that for which he has prepared himself, lest he throw too great a strain upon heart and muscles unprepared for it. Some men have abundant staying powers; others are natural sprinters; few possess both qualities. Consequently an effort must be made to develop that which is lacking; but it is well to remember that most races are won in the last quarter, and that if one knows pace well and is able to finish fast and strong, he may save himself much anxiety during the race and be all the more likely to win in the end.

Should the rider find himself becoming "stale" at any time; that is, feeling overworked and fatigued, he should stop all work

for one, two, even three days, or a week, maintaining, however, the regimen of diet, regular hours, etc. Should he continue to exercise while in that overtaxed condition, he would soon find himself deteriorating in power and speed rather than gaining. For a kindred reason, the rest and recuperation of the system, one should abstain from any but the mildest exercise on the day before a contest, in order that he may enter it with a zest, and a confident feeling that the reinvigorated muscles will quickly respond to any demands made upon them. There are other minor details which will have to be considered in the course of any training, but which the limits of this article prevent me from discussing at present. The essence of it all, however, is the conservation of energy and the ability to use that conserved energy to the utmost at the proper time in a contest.

As will be seen from the above remarks, to train properly, and still more, to be successful in a race, requires a peculiar combination of qualifications not often found primarily in an individual, and usually developed under severe discipline only. And though I fully believe that such a course of training as I have sketched, if faithfully carried out would be beneficial to almost any one, not only physically, but also mentally and morally, my advice to the great majority of wheelmen would be to let racing severely alone, for unless the training be sincere and adequate there is real danger that the fast speeding will do more physical harm than good. Especially is this true of anyone who has any other serious business occupation, for training requires so much attention to details and such freedom from mental worry, that if the attempt is made to pursue it and business at the same time, the chances are that one or the other, or, more likely, both, will suffer in consequence. Moreover, while we are all glad to see new records made, and to have it demonstrated that man on his wheel can rival the horse in speed, it cannot be gainsaid that a proper course of training is no sinecure, and that abundant health, exercise and pleasure for almost anyone can be secured by using the bicycle frequently but at a moderate speed.

In conclusion, I wish to say that these remarks apply equally to track and road racing, both needing the same careful preparation and attention to detail in discipline. And I should be most lacking in courtesy should I not acknowledge my indebtedness to my friend, Dr. Randolph Faries, the efficient director of physical education at the University of Pennsylvania, for many valuable suggestions which I have endeavored to make use of in this paper.

Physical Culture.¹

BY CAPTAIN T. D. LANDON,
Commandant of the Bordentown (N. J.) Military Institute.



HEN asked to read a paper upon physical culture before the New Jersey Sanitary Association, my first thought was in the form of the question, "What bearing does physical culture have upon the work of a sanitary association?" In the explanatory notes of the official programme I find the following statement: "The object of the association is to bring together all who feel an interest in the investigation of facts and principles relating to public and personal hygiene, and who desire to diffuse among the people such information as will secure deliverance from avoidable causes of disease."

In conformity with this object this paper on physical culture was prepared.

All sanitation is a species of warfare. The warfare is carried on between the individual or a number of individuals and a particular disease or disease in general. It may be a question as to which is the attacking party, disease or humanity, but there is no doubt that humanity is decidedly a combatant in this struggle. Among the principles of warfare is the idea of keeping the fighting force in as strong and perfect condition as possible, that it may the more easily, and with the least injury to itself, destroy the enemy.

With this idea, that humanity is fighting disease and fighting with weapons we call sanitary measures, there is, in the majority of minds not educated to the contrary, the idea that too much attention is paid to the attempt to destroy *disease* in all its forms in proportion to that paid to the cultivation of the individual to that highest physical development which will enable him to render the best possible service by reason of imperviousness to it.

Therefore I come to the study of the need of development of the individuals engaged in the struggle. Much can be said of

¹ Read before the annual meeting of the New Jersey Sanitary Association, held at Lakewood, N. J., December 9 and 10, 1892.

the important part physical culture had in the life of ancient times. From the most remote times the development of the body and all its powers has been considered as most necessary to great success. The educational methods of Greece and Rome, with their share of races, wrestlings and other physical contests, need only to be spoken of to bring to mind what a large degree of importance they attached to the development of the body as well as the mind. All this you may say was by reason of the constant state of warfare in which these nations were engaged.

Is not all life a warfare where too often the spirit is willing enough but backed by flesh that is weak. From the idea of the recognition of the importance of physical culture by the ancients and the high state of their mental as well as physical abilities therefrom, we cannot but wonder at the loss of interest that seemed to follow those times.

Among the reasons for the loss of interest in the importance of physical culture until comparatively recent years, I submit the following extract from a paper by Lieut. Harrison, Second Artillery, United States Army: "It was not until the invention of gunpowder that we can record the decadence of physical culture. The revolution caused thereby in the weapons and mode of warfare seemed to proclaim the uselessness of bodily superiority, and all efforts at its acquirement were regarded as so much energy mispent. The nations of the world drifted into a state of physical lethargy and the human frame gradually deteriorated."

This harmonizes with my idea of warfare with disease. The new methods of science, the development of skill and learning in the medical profession has rendered many careless of individual obligation to make the best and strongest of ourselves, on the ground that the doctors and the board of health will take care of the whole thing.

Doctors and boards of health will admit how one-sided this is as a security of deliverance from avoidable causes of disease.

The recognition of the importance of physical culture has been slowly gaining ground, particularly among the colleges and secondary or preparatory schools.

This is good as far as it goes, but the consideration of a public body should be given on the line of "the greatest good for the greatest number." If the questions should be asked, "Where can physical culture accomplish the most good? where is it most needed?" I would argue that in the public schools is the greatest need and the largest field for the best results, all things considered.

They have the greatest need, because there is where the least work in this line has been, or is, done. The largest field for good, because there are to be found the greatest number of those at an age most susceptible to development of any kind.

The adults of the present generation are past any probability of being affected to any great extent by work in this direction. That is, they cannot by any amount of work make themselves materially taller or broader, though they may put themselves in prime fighting trim. But taken at the age that exists in our public schools, the succeeding generations can be a taller, broader, straighter and stronger type of manhood, less subject to many "ills that flesh is heir to."

The greatest obstacle to advancement in this direction lies in prejudice. The idea that a boy goes to school to study, and that he wastes or loses time when he devotes any fair proportion to physical culture, is a common one from the minds of those who have the scholastic department in charge. I quote portions of an editorial from *Harper's Weekly*, December 3, which I think is *apropos* at this point. Under the head of "Foot-ball and Study" the writer says: "There will doubtless always exist a class in the community—wholly inappreciative of the value of athletic sports and contests to our institutions of learning. Some are learned bookworms, with a higher regard for marks and standing than for intellectual delights. Their muscles are soft. Their lungs are rarely filled with fresh air. Their knowledge is as dry as the heated rooms in which they dwell. Their digestion is disordered. This is a small class, and not nearly so important and influential as it was a generation ago.

"The stimulus of physical exercise afforded by athletic contests has appreciably benefited the reading men, and must result in bestowing upon the teachers and professional men of the future, as upon all the coming generations, better bodies and longer lives. There will be fewer throat and lung troubles in the pulpit, fewer nervous prostrations at the bar and in medicine, heartier men in all the walks of life that in our fathers' day, and much more of our own, were filled with this dyspeptics." With a due proportion of physical work the brain will be benefited rather than suffer a loss.

A sound brain in a sound body. The brain is a *part* of the body, and dependent, therefore, upon the condition of the body

for its force and vitality. The whole is greater than its parts, and, therefore, the preservation and cultivation of the whole cannot but benefit all the parts thereof. To be sure, in physical development, the cultivation of the whole is reached not at once, but step by step, part by part. The object, however, is not the individual part benefited and developed, but the final all-round perfect condition of the whole as a unit, and with all its parts subject to it. To illustrate, I have had more than one boy come to me sluggish in body and mind, so sluggish, indeed, that after giving him a command you might, with a watch, time the action of his brain and its control over the members of his body. Body undeveloped, brain constitutionally *tired*. After a few weeks or months of the "setting-up" exercise and the development of the muscles, we find him *strengthened*, but more important far, we find him, as a whole, more a master of all his members. His mind and will power does not require *time* to communicate its *desires* to his members, but *flashes* its *commands* instantaneously throughout his whole body, to find a prompt, accurate response.

In other words, the few weeks' physical culture has made him a better conductor of intelligence and energy. Did that boy need to have his time guarded lest he lose some study time? Did he not more need that some of his time be directed and required to be spent in physical culture?

That this State has recognized the importance of this subject is shown by the recently developed physical culture department in its school for teachers at Trenton. This means that the teachers are being educated in this direction, but it will depend somewhat upon the sentiment of the localities into which they may be sent, whether the work will get beyond the theoretical.

The question of system is of secondary importance. If the schools once accept the view of the importance of physical culture as a part of their legitimate work, the system will soon be found. The system itself will be improved and adapted to local requirement after trial and experience. In this brief paper I have left out details and statistics, only trying to show, if possible, that the subject of physical culture may well claim the attention of this association as one factor that will secure deliverance from avoidable forms of disease, to say nothing of the advancement of the coming generation in the direction of longer lives of greater capacity and endurance, thereby creating a general condition of prosperity and happiness.

**Santa Fe (The Holy Faith), New Mexico, as a
Sanitarium.**

BY HENRY F. Lyster, M.D.,
Detroit, Michigan.



HIS oldest of American cities, with the exception of St. Augustine, Florida, is nestled in the Rocky Mountains, in the Territory of New Mexico, in the northern portion of an elevated valley, 7015 feet above the sea.

Singularly enough, these are to-day the two cities of this continent which stand out conspicuously as health resorts.

Florida is well adapted as a winter resort for many cases of irritative bronchitis, where the lung tissue has not been invaded by inflammatory deposits, and also for laryngeal inflammation, but it has never been a safe place to send invalids who have inflammatory infiltrations of the lungs, whether tubercular or non-tubercular in character. Those cases not infrequently soften and break down and form cavities in the lungs with great rapidity, as they do in those who visit the West Indies, and other warm, moist climates.

Southern physicians were accustomed, as is noticed in Blodgett's work on "Climates of the United States," published about 1844, to recommend to their incipient consumptive patients the northern regions of Michigan and the upper great lakes for a lengthened residence.

While, as a rule, cases of the character above mentioned should seek a warm, dry winter, and a dry summer climate in an elevated region, it is an accepted fact that many persons have been cured in the warm moist air and lower altitudes of the south. There are so very many reasons why this should have been so that it is hardly necessary to allude to, among others, change of occupation and scene, to a life in the open air, to exercise out of doors, as important factors in producing improvement in hundreds of patients.

The conditions which give a marked preference to the elevated mountain valleys of Colorado, New Mexico and portions of Arizona, are the warmth and dryness of the winter season, the

elevation, varying between 5000 and 10,000 feet above the sea, and the agreeable coolness of the nights in summer.

This country, well represented by the old Indian and Mexican city of Santa Fé, is an all-the-year climate for invalids, and it is desirable to make them aware of the fact. It is not necessarily the pulmonary cases alone that might go there with benefit, and with, in numerous instances, bright prospects of permanent cure, but persons who have chronic malaria, dyspepsia, heart disease, with good compensation—Bright's disease, general debility, chlorosis, anemia, nervous exhaustion, alcoholic habits, ennui, functional and incipient or limited organic disease of the liver, with or without moderate jaundice or dropsy—all of these conditions will find here the road to a possible cure, and in many cases it will lead to the most satisfactory results.

Santa Fé possesses a multitude of conditions which favor its selection as a health resort for all the seasons of the year.

It lies in an elevated valley among the foot hills of the adjacent Rocky Mountains. The mountains rise to the north and east and west, and the valley slants toward the south for thirty miles, where it reaches mountains and high table lands at the Ortiz and Los Cerrillos. On the west a ridge divides the valley of the Santa Fé from that of the Rio Grande, a few miles away. It will be seen from this that invalids are protected there from the winds from the east and north and west. The winds from any and every direction must go over or around, being diverted by the mountain ranges. It is this fact, that the February and March east winds are prevented by the mountains to a considerable degree, that determines those acquainted to try it.

The sun, as a rule, shines very brightly almost every day, and all day long, the whole year round. The following meteorological statement is from the United States Local Weather Service, for the year 1891 :

Average temperature	47.3° F.
Average relative humidity	51.3
Average velocity winds, miles per hour.	7.3
Total rainfall, inches	16.73
Number of cloudless days	195
Number fair days	107
Number of cloudy days, where more than one-fourth the heavens are cloudy	63
Annual mean temperature, 1891	47.3° F.

January monthly mean	28.3
February “	31.7
March “	39.1
April “	45.5
May “	56.0
June “	65.4
July “	68.0
August “	65.9
October “	49.4
November “	36.7
December “	40.2

One year does not vary from another to any great degree. While the other seasons are so relatively bright and charming, the summer and autumn are universally commended by those who have been here for many years. The days are not too hot, and the nights are cool enough to require a blanket on the bed.

Most charming views abound in every direction. The Pueblo Indians have one of their peculiar adobe towns, called Tesuque, within ten miles, over toward the Rio Grande. Beautiful cañons in the mountains, and mountain drives are on all sides. The Santa Fé River, or brook, runs rapidly over its rocky bed, with banks on either side, far away from the little stream, showing that sometimes a rainstorm in the mountains, or suddenly melting snow, turns it into a rushing torrent. The walls of granite and flint, and many other of the hard fire rocks upon its sides, show in the cañon of the Santa Fé what, in cycles of years, may be done by water power.

A mineral spring lies up in the cañon about three miles—a delightful drive. The analysis by the Smithsonian Institute is herewith given.

In 1000 parts of water:—

Silica	0.2200
Calcium carbonate	2.5380
Magnesium	0.6050
Calcium sulphate	0.0560
Sodium sulphate	0.2250
Sodium chloride	0.1930
Total solids	2.8310

parts, with enough free carbonic acid to retain the carbonates of calcium and magnesium in solution as bicarbonates. This soft and very pure water is admirably adapted to persons with dyspepsia and liver and kidney diseases.

The "Colorado Carlsbad" may be given for functional and organic digestive diseases; also to cases of Bright's disease. This spring is in the immediate vicinity of Denver, and is an extremely agreeable and efficacious diuretic and mild laxative.

The following is the analysis:—

	Total in 1 gallon.
Sodium sulphate	64,536 grains.
Sodium chloride	11,336 "
Calcium sulphate	27,912 "
Calcium carbonate	22,264 "
Magnesium sulphate	11,368 "
Ferrum et aluminum et silica	traces.
Total solids	117.5 grains.

1.97 parts in 1000.

A camping-out party leaves Santa Fé early in July for a couple of months' trip into the mountains and pine forests and high valleys of northern New Mexico. The party consists of ladies and gentlemen, accompanied by a physician as captain and guide. The party is mounted on mules, and a pack train of mules, with provisions and tents and camp supplies, accompanies it. They live out in the open air this way all summer. Game is obtained in greater or less quantity, and brook trout abound in the clear mountain streams.

At Buchfahrt, in the Thuringian pine woods in Germany, up on the mountains, there are summer stations open all the time, with shutters to let down in winds and storms. These are for pulmonary cases chiefly, to enable them to live outdoors. Large numbers derive benefit by this means, and yet there is no comparison between the humid climate of Germany and the dry air of New Mexico as a means of cure in those cases.

Marked improvement in digestion and constitutional weight and strength of those belonging to the tent hospital has been the general result in previous camping.

I have reserved for the last the best features of this region. There is perfect quiet there; there are no factories; the railroad depots are outside the residence portion of the city. There are no pavements; none are needed. An occasional bray of a burro (donkey) breaks in upon the quiet stillness of the air, or the bugle call at Fort Marcy, or the regimental band in the afternoon on the plaza, or the harmonious and social bells of the beautiful cathe-

dral are heard in quiet melody, and without any quarreling and jangling with neighboring parishes.

Then there is the Sanitarium of St. Vincent, under the management of the good Sisters of Charity from Cincinnati, a lovely hotel for invalids, where it is a pleasure to get well, and where, if fated to die, death would be robbed of half its terrors in the presence of such faith and works and the beautiful sunshine.

To those who have, in hunting for winter sunbeams and cool summer days and nights, passed from hotel to hotel in their several routes, and have noticed the missing link between cost and comfort—the poached egg, as it were, on the cold plate—the ventilated toast—the copper-tasting tea—will here find all that they have desired and more than they have deserved for the price demanded.

St. Vincent's Sanitarium is an oasis in the desert of houses of entertainment for invalids, and is only one of the many good works in the care of the Sisters of Charity'. A large hospital, a school and an orphanage near by attest their energy and devotedness to the work of the Master whom they serve.

The effect of the whole range of the Rocky Mountain country upon the health of persons going there from malarial regions and the lower altitudes of the East and South has not been generally known or studied.

I am convinced that we have a very potent influence, in the elevation or altitude, upon all who visit it. This is noticed in the marked improvement of the circulation and color of those residing but a short time at an elevation of from 5000 to 8000 feet above the ocean. The circulation in the liver is markedly increased, as shown by the removal of the jaundiced appearance of the conjunctiva and of the skin so frequently accompanying it.

The destructive action upon the red corpuscles, and consequent rapid anæmia, which is present when passive hyperæmia or torpidity of the liver exists, and which is shown by the coloring of the blood in the high-colored urine, gives place to their rapid formation, upon the improved circulation. The oxidation of uric acid in the blood is promoted, and the lateritious sediment, or red deposit, so constantly observed in the urine of those who suffer from malarial toxæmia, diminishes, and as the circulation of the liver becomes accelerated, disappears, giving place to a clear, amber urine of normal specific gravity, and one which remains clear upon standing in a cool place. These changes are enhanced

by the use of the warm bath every two or three days, in addition to the exhibition of cholagogue remedies and tonics.

In the laudable endeavor to prevent the formation of the deleterious habit of the daily use of cathartic medicine, it is a fact that we lose the opportunity of relieving cases where torpid livers are present, and where malaria exists. The use of cholagogues, notably aloes, in connection with podophyllin, and with hyoscyamus and capsicum to prevent pain, should be advised at bedtime; some soft, slightly alkaline water may be used in the morning, and throughout the twenty-four hours, in such a quantity as may be desired to flush the kidneys, and promote a laxative action to the extent of two operations in each day. Tonics and anti-malarial remedies, such as iron, quinine, arsenic, should also be given in connection with a good, generous diet, and plenty of out-door air, the patient walking, riding or driving, according to taste or opportunity.

Until quite recently, we have not possessed the transportation or railroad facilities which would offer the best conveniences for travel, but now we have all of those represented by a large number of first-class railroads, which rival each other in reaching the most desirable places all through the west. Old Mexico is now reached by the Mexican Central and its branches, so that now that incomparable winter climate is attainable for tourists and invalids. We have in Mexico a warm, dry, winter climate, a country protected from northers by the high and extensive range of the Sierra Nevada and Rocky Mountains. We also have the high, dry, central upland valleys, free from malaria, affording all the advantages of warmth and protection from cold and sudden changes, and those benefits which obtain from an elevation, varying from 4000 to 8000 feet above the sea, with foot hill and mountain ranges of a much greater altitude. We possess a sanitarium in the west and in Mexico, which is in many respects superior to that of Italy and the south of France, in the freedom from malaria, the immunity from hot or cold winds, and the decidedly increased elevation.

While we have all the delight of visiting new and strange countries, and observing the civilization and customs of these primitive people, as represented by the Mexicans and Indians, there are still existing the discomforts of American hotels, which, to invalids, who, from inability, are not able to readily look about them for the purpose of improving their residence, are almost insupportable.

How the memory reverts to the quiet, little German inns, unpretentious, cheap, clean, and with well-served and deliciously cooked meals, the whole establishment in keeping with the picturesque surroundings. The time will come when the pleasure and agreeableness of invalidism will be greatly enhanced, and the cure by change of residence and climate in this country will become popularized. The constant moving on and spirit of restlessness, which pervade the tourist, are not conducive to the best results, but a spot should be chosen, and the patient remain some time as an actual resident, in this way becoming acquainted with the objects of interest in the neighborhood as well as with a number of the residents of the place.

Disease.

BY GEORGE G. GROFF, M.D.,

Of Lewisburg, Pa., ex-President of the State Board of Health of Pennsylvania.



HEALTH is the normal working of the human mechanism. *Disease* is the abnormal and obstructed working. *Death* is the final cessation of the functions of life. When the digestive system imperfectly performs its labor the blood becomes impure, nutrition and assimilation are retarded, and disorders of the body follow. Bad air, insufficient and bad food, overwork, cold, damp, worry, miasma, each affect some part of the organism; its imperfect working affects another part, and unless nature's forces speedily rally, the patient is prostrated by what we call disease, or is exhausted by the imperfect working of his physical mechanism.

IDEAS OF THE ANCIENTS CONCERNING DISEASE.

The ancients believed that in each organ and in each fluid of the body resided a *spirit* which presided over its functions. Disease was the abnormal working of a part from the presence of an *evil spirit* or spirits. Hence, the proper method of treatment was to drive out the evil spirits. Later, it was believed that diseases were *judgments*, sent by a just God as punishments upon

men and society, and were intended both to punish and reform them. In such a light, cholera, famine and plagues were formerly viewed, and as a result quarantine and hygienic measures were opposed, and it was thought relief could only come from imploring the assistance and forgiveness of an offended Deity.

PRESENT VIEW OF DISEASE.

All intelligent persons of the present time believe that health is the normal condition of beings, and that every disease is abnormal and produced by some sufficient cause working in the system.

In old age the mechanism simply wears out. An organ from feebleness may be easily overcome, and, failing to perform its work, cause disaster to the rest; but in ripe old age death may come without disease.

CAUSES OF DISEASE.

These may be tabulated thus :

Hereditary: Consumption, gout, epilepsy, cancer, scrofula, etc. Here a tendency rather than a disease is hereditary.

Functional: that is, depending upon the action, either too great or too little, of one or more of the organs, or of the body generally. Examples: Over-exertion, over-excitement, loss of sleep; or, on the other hand, want of exercise.

Mechanical: as wounds or injuries of various kinds, tight lacing, etc.

Conditional: as extremes of heat or cold, sudden changes of temperature, dampness of dwellings.

Digestive: as poisoning, unwholesome food, intemperance, abuse of medicine; and, on the other hand, starvation.

Obstructive: as neglect of the bowels, uncleanness of the skin, ill ventilation.

Contagious: as smallpox, itch, hydrophobia.

Atmospheric: as autumnal fevers, yellow fever, cholera.

Another classification is given below of diseases which may in large part be considered preventable :

(1) *Filth Diseases*: Diarrhoea, cholera, typhoid fever, typhus fever, dysentery, diphtheria, consumption.

(2) *Contagious or Infectious Diseases*: Smallpox, scarlet fever, erysipelas, measles, typhus fever, puerperal fever.

(3) *Catarrhal Diseases*: Coughs, colds, bronchitis, pleurisy, pneumonia, rheumatism, gout, venereal diseases.

(4) *Mental Diseases*: Caused by overwork, worry, excitement, mental strain, inheritance.

There is a tendency at the present time to refer all contagious diseases to the effects of minute forms of life called bacteria. The reader may be interested in an extract from a work by Ferdinand Cohn, a distinguished German botanist:

“Every one knows in how many relatively different sizes the life of the visible world embodies itself. The mites belong to the smallest creatures visible to the naked eye. They are found in numberless swarms in cheese and in fruits rich in sugar. Their size compares to that of man about as a sparrow to the Strasburg cathedral. A similar comparison may be made to the giant fir tree and the moss which grows on its bark. Of the little animalcules that Leuwenhook discovered he said that their size compared with the mite as the bee with the horse. The more the microscope has been improved and its magnifying power increased the smaller have been the beings that become accessible to keen observation, since among the animals and plants of the unseen world a difference in size is found similar to that between the herring and the whale.

“But the smaller the organism the simpler appears its form, the more imperfect its life and energy, and the lower its place in the rank of created beings. Among the animals of the microscopic world we find exceedingly few that possess the fullness of organs of an insect, a crab, or even a worm; the true infusoria stand on the lowest step of the animal kingdom. Even so we find among the microscopic plants not one that reaches the developed form of the blooming plant, or belongs to even the lowest class of the ferns; only the lowest plant forms, which we usually designate as algæ and fungi, form the forests and meadows of the invisible world.

“But the more the inner formation of microscopic organisms is simplified, the fewer appear to be the characteristics which so easily separate plants and animals in the visible world. The infusoria are wanting in muscle and nerve, while vessels and breathing organs are very imperfectly developed. On the other hand, microscopic plants show independent movement, and even organs of movement, such as we are only accustomed to find in animals. In the very lowest organisms, animals and plants appear to run into each other, and the naturalist is in doubt to which of the two kingdoms he shall assign the subject of his investigations.

“But the smallest, and at the same time the simplest and lowest, of all living forms, we call bacteria. They form the boundary line of life; beyond them life does not exist, so far at least as our present microscopic expedients reach, and these are not small. The strongest of our magnifying lenses, the immersion system of Hartnack, gives a magnifying power of from 3000 to 4000 diameters; and could we view a man under such a lens he would appear as large as Mont Blanc, or even Chimborazo. But even under this colossal amplification the smallest bacteria do not appear larger than the points and commas of good print. Of their internal parts little or nothing is to be distinguished, and even their existence would for the most part remain hidden did they not live in such gregarious masses. These smallest bacteria may be compared with men about as a grain of sand to Mont Blanc.

“If it is important on their own account to learn to know these smallest and at the same time simplest of organisms, then will our interest be increased through the knowledge that just these little forms are of the very greatest moment; since they, with invisible, yet irresistible power, govern the most important processes of animate and inanimate nature; and even seize on the being of man secretly, but at the same time fatally.

“The forms of bacteria resemble sometimes balls or eggs, sometimes shorter or longer rods or fibres, and sometimes corkscrews or screws. The bodies consist of an almost colorless albuminous substance, in which numerous shining, fatty granules are imbedded, and which is inclosed in a thin membrane (cellulose), insoluble in caustic potash. According to their form, we can distinguish ball, rod, fibre and screw bacteria.

“Nearly all bacteria possess two different modes of life, one of motion and another of rest. In certain conditions they are excessively mobile, and when they swarm in a drop of water, moving among each other in all directions, they present an attractive spectacle, similar to that of a swarm of gnats or an ant-hill.

“The collective development of the bacteria makes it in the highest degree probable that they belong to the vegetable kingdom, and in nearest relation to the oscillariæ. Bacteria also change from a condition of movement to one of rest when they cannot be entirely distinguished from common plant cells. They swarm only where there is favorable temperature, plenty of nourishment and the presence of oxygen; under unfavorable conditions they are motionless. Certain kinds of spherical bacteria appear never to move.

"A compressed yeast factory gives a plain example of the colossal proportion in which these little microscopic organisms can increase if abundance of nourishment is given them, and they are carefully protected from the opposition of other beings. The yeast fungus exceeds the rod bacteria in mass and weight probably 160-fold. The weight of a yeast cell is also about 0.000.000.25 milligrammes, or 40,000,000 of yeast cells weigh one kilogramme. If they are in great vats filled with suitable food, and are allowed to remain undisturbed, inside of twenty-four hours over one hundred weight of east is generated. Probably there are over fifty milliards of cells which form such a mass in the course of one day from a single grain.

"Bacteria belong to the most widespread of organisms; we may say they are omnipresent; they never fail either in air or water; they attach themselves to the surface of all firm bodies, but develop in masses only where decomposition, corruption, fermentation or putrefaction is present. If we place a piece of flesh, a pea or other animal or vegetable material in water, it will become, earlier or later, thick, and then milky. It loses its transparency, because the bacteria completely fill the water; at the same time the putrefaction increases, under the development of different, and for the most part, bad-smelling chemical combinations. After a time the thickness disappears, and the water becomes clear and odorless, the organic material is consumed by the bacteria; these now cease to divide themselves further, and heap themselves on the bottom as white sediment, without motion. If a new supply of nutritive material be added to the fluid, putrefaction and the multiplication of bacteria, which are not dead, but in a state of temporary repose, are seen to begin anew."

Humanized Sterilized Food for Infants.

BY PROF. ALBERT R. LEEDS, PH.D.,
Of the Stevens Institute of Technology, Hoboken, N. J.



AM in receipt of your letter, inclosing a communication from a lady requesting you to publish an article on the preparation of sterilized milk and cream for the feeding of infants. Your correspondent says her object is to do the best for her own child, who must be fed from

the bottle. Such being the case, I would advise her not to use milk, as it is ordinarily sterilized, at all. Any druggist will provide her with the apparatus for sterilization, which is simply a convenient tin boiler for keeping the flasks containing the milk in an atmosphere of steam for half an hour or longer. But the milk thus sterilized is simply rendered practically free from bacteria; it is not by this process modified in any way that peculiarly adapts it to infant nutrition.

That modification can be effected in no other way that I am aware of than by so changing the ratio between the constituents of cow's milk as to make the ratio approximately the same as it is in breast milk. In other words, the albuminoids of the cow's milk must be diminished to one-half, and the milk, sugar and fat must be notably increased, and the value and proportion of the saline constituents must be also modified. This is satisfactory so far as it goes, but the modification thus effected is not enough. Dilution by the addition of water will cut down the amount of albuminoids to the right amount. It also tends in slight degree to prevent their coming together into hard, cheesy clots. They must be changed in their character, so that when the milk begins to undergo digestion in the stomach of the child the curdling which at once ensues shall be in fine particles, as it is when breast milk is digested.

To effect these desired changes I have used the method advised in connection with the preparation of milk for infant feeding by means of the Fairchild peptogenic powder. Elsewhere also I have published the analyses, showing the close approximation of the cow's milk thus humanized in composition and properties to breast milk. I purposely used this humanized milk in feeding my own child at the age of three months, steadily increased the quantity and diminished that of breast milk, until at the age of eight months the child was fed exclusively on humanized milk. At fourteen months the first solid food was given. Up to this time there had never been an hour's illness; and afterward during teething and the use of a mixed diet of humanized milk and simple solid food whenever any symptoms of trouble appeared, the diet was at once changed back to one of the humanized milk entirely. Such milk prepared from good fresh bottled cow's milk, as can now readily be obtained from reputable dealers, is very uniform in composition and assists in preserving the same regularity in health and nutrition of the child.

But the question may be asked, why should this milk be sterilized and how can it best be done? The reasons for sterilizing it are, first, that breast milk is sterile, and, secondly, to do away with the possible presence of disease germs. In its preparation the humanizing is first effected, and then the sterilization by raising the temperature to the boiling point. The same result can be achieved by heating to 165° F., this sterilization by heating to the lower temperature being called pasteurization. Practically I prefer the latter method, and I do not find that nurses encounter any trouble in practicing it. But the former method is simple in the extreme, and has, therefore, been the method adopted and recommended.

The Use of Meat in Childhood.¹

BY WM. H. FLINT, M.D.,

Visiting Physician to the Presbyterian Hospital, New York City.



HEN shall we begin to give our children solid food? and when shall we commence to give them meats? Mother Nature has kindly answered the former question for us, and the opinion of those most competent to interpret her reply is epitomized in the following sentences from an article in this magazine for August, 1889, by Dr. Baruch: "The teeth are the unerring guide—follow Nature's guide alone. Until the child has four molar teeth, let him have naught but liquid or liquefied food."

Even a moderate amount of philosophical acumen will enable us to understand the justice of this dictum. So long as there are no teeth, or only cutting teeth, whose function is confined to biting, milk alone is the proper food. By the arrival of the grinding teeth, or molars, Nature intimates that her wonderful laboratory is ready for the reception and transformation of foods requiring mastication, and invites us to their employment. Her answer to the second question, When shall we give children meats? is somewhat ambiguous, and must be sought in the results of individual experience. It is, however, true that we may, within certain limits, apply the same anatomical method to the solution of this

¹ From The Mother's Nursery Guide.

problem which we find so useful in deciding when to begin the use of solid foods in general. In carnivorous animals the canine or eye teeth are largely developed, and are evidently intended for the laceration of cohesive animal tissues. Now, the first set of human canine teeth generally appears later than any other of the so-called milk teeth except the second molars, and so we are justified in the conclusion that meats may best be withheld until these canine teeth appear, or even until the first dental set is complete.

Physiological chemistry also aids us in deciding when to begin giving meat. The best authorities in biological matters tell us that the hydrocarbonaceous foods, *i. e.*, starches, sugars and fats, supply muscular force and bodily warmth, while the nitrogenized foods are constructive in character, more particularly promoting the growth, development and regeneration of the tissues. This view is forcibly and happily presented in *The Mother's Nursery Guide* for July, 1892, by Dr. J. Madison Taylor, who there says: "The nitrogenized foods are those which are demanded in structure building; in short, from which the bodily parts are steadily built up, and, hence, are more needed in early life. The hydrocarbons are more evanescent in their action, and act rather as the fuel analogous to the coal in the railway engine, the consumption of which generates force and drives the machinery."

It is therefore plainly our duty to see that our children are provided with such nutritive materials as will furnish them with the most complete and symmetrical physical development possible; for, if the right foods are not furnished, the body will be dwarfed and stunted, even if it escape positive disease, and no later efforts can make good the loss of these constructive materials during the critical period of growth and development. The demand for tissue-building aliments must be met by the administration of foods rich in nitrogen, and meat is the typical food of this class. All theoretical considerations, therefore, favor the use of meat in conjunction with other nitrogenized foods, as milk and eggs, so soon as the teeth are adequate to its perfect mastication.

The majority of children above two years of age thrive upon a diet into which meats enter in varying proportion, but, in practice, the only safe rule is to be guided in each case solely by the visible effects of the meat diet. If much milk or many eggs are used, less meat is naturally required, and it is never desirable

to furnish more than one representative food of the nitrogenized group at any single meal. Thus, milk and meat, or eggs and meat, should not be given simultaneously, lest the digestive powers be overtaxed. Milk and eggs may, however, be given together in suitable quantities, but even these foods are best administered separately.

Other questions of paramount importance, touching the use of meats by children, relate to the varieties of meats to be employed and to their proper preparation. The best kinds are, in the writer's opinion, cold mutton, mutton chops, venison, tenderloin, sirloin steak, lamb chops, roast beef, rabbit meat and chicken; these meats being here arranged in the order of their apparent relative digestibility. Veal, pork, turkey, goose and duck, should be excluded from the children's bill of fare.

It may be stated, as an axiom of the nursery kitchen, that children should not have meats which are either fried, hashed, stewed or twice cooked. This rule will exclude croquettes and the countless complex dishes elaborated by French professors of the culinary art. Children's meats should be either broiled, roasted, baked or boiled. Mutton should be thoroughly cooked, *i. e.*, until it is no longer red, but never beyond that exact point, and the same remark applies to lamb and to venison. Steak should be broiled rare, the outside being coagulated and browned sufficiently to retain the juices of the meat, and the inside should be red, yet not raw. In order that these conditions may be attained, the steak should be rapidly turned while broiling. In some of our best appointed cuisines meats are broiled beneath the fire, instead of above it. The arrangement for the application of this method is, in outline, the following: On the lower side of small gas pipes, which are arranged in parallel rows, are numerous small apertures from which the gas escapes. When ignited, these numerous gas jets look not unlike a bed of hot coals seen from beneath. The broiling iron is placed beneath the flames, and thus the meat is cooked from above. This method obviates the loss of much meat juice which, even if it exudes from the broiling surface, cannot escape, but is eventually reabsorbed by the fleshy tissues.

Roast beef should be done rare, but chicken thoroughly cooked. Beef juice, mutton broth and chicken soups are also easily borne by children.

Concerning the frequency with which meat may properly be

given to children, and regarding the time of day best suited to its administration, opinions differ widely. The writer believes, on the basis of his own experience, that children under five years do best with only one meat meal *per diem*, this being best given in the morning or at noon. After five years, both the breakfast and the mid-day meal may include some meat. An ideal dietetic schedule, however, for most children, would embrace eggs at breakfast, meat at noon and bread and milk at night, appropriate cereals being supplied with the eggs and the meat.

All meats for children should be carefully cut into little pieces, and children old enough to cut their own meat should be cautioned to make the pieces as small as possible. In addition, children should be instructed to thoroughly chew their meat, as well as all their cereal foods, for although animal food may not require so much mastication as vegetable to insure its digestion, it should still be presented to the stomach in the most complete state of disintegration attainable.

The Economy of Having a Health Officer.

BY HENRY B. BAKER, M.D.,

Secretary of the State Board of Health of Michigan.



IN Michigan the State Board of Health has the names and addresses of over 3500 physicians. I think it safe to estimate that the average annual income of these doctors is at least \$1000 each; and, if so, the people of this State pay \$3,500,000 a year to those whom they employ to prescribe for the sick. If in respect to sickness we admit that an "ounce of prevention is worth a pound of cure," one-sixteenth of \$3,500,000 (\$218,750) judiciously expended in the prevention of sickness would be worth as much to the people as the whole sum spent for the cure of sickness; or, if the whole 3500 doctors were employed and the \$3,500,000 expended in the prevention of sickness, the benefit to the people would be sixteen times as great as now, and would have a money value of \$56,000,000. And yet not all the sickness is preventable. The debt of nature must be paid at last. When science has failed to prevent sickness, the skillful physician can often aid in nature's efforts to recover strength, and when death is certain he can

often make easier the last days of suffering. But can any rational person suppose for an instant that if one-sixteenth of the 3500 physicians now employed in prescribing for the cure of diseases were constantly employed and paid for their services and their success in searching out and applying all possible knowledge for the prevention of sickness and deaths, it would require all the remaining 3282 physicians to prescribe for the sickness which would not thus be prevented? Can any one suppose that many of the present heavy burdens of the people would not be removed?

Omitting mention of the most important direct benefits of the prevention of sickness, and noting only the indirect benefits not so frequently dwelt upon, let us think of the vast sums of money now paid to maintain poorhouses, hospitals, insane asylums, asylums for the deaf, dumb and blind, jails, and even prisons; much of this expense would then be entirely unnecessary; and many of the causes for demands now made for private charity would not exist; thus, as I believe, not only our personal expenses, but our State, county and municipal taxes would be materially lessened, the prosperity of our people would be something wonderful when compared with our present condition, and the phrase, "Life, liberty and the pursuit of happiness" would have its first and last terms wonderfully emphasized.

There is no reason to fear that we should suffer for want of doctors, even if we were to ask every one of those practicing to change his employment to the prevention of sickness. If more were needed, I think they would be forthcoming; but suppose every one of the 1261 local boards of health in this State should constantly employ one physician as a health officer, there would still remain 2240 doctors to attend to the sickness which the other third failed to prevent; and 1261 physicians who would then be constantly employed as health officers of local boards of health would cost for permanent salaries only a small part of the \$3,500,000 which is now estimated to be paid to physicians.

The main reason why we need an active health officer, who understands his business, in every city, village and township, is that the people do not now seem to know the preventable nature of the diseases which kill them. In many places they stand by like dumb animals and suffer their children to die of diphtheria and other communicable diseases, and never lift a finger to try to prevent the spread of these diseases. This apathy and ignorant disregard for human life is not confined to the rural districts, but is seen in some cities.

The Indian Sweat-House.¹

BY A. B. HOLDER, M.D.



HIS institution is an important factor in Indian life—and death—antedating history and being nearly coextensive with the race.²

As in most of the affairs of the Indian's daily life, in the sweat-bath is a puzzling mixing of religion and ceremonial with more material effects, until one is in doubt whether it be natural or supernatural aid that is sought. The ceremonial side I shall leave to those who write of the ethnology of Indian disease and medicine.

The sweat-house is the most characteristic object of the Indian country; every camping place and every permanent abode, river side or mountain top, is decorated with one or a dozen of them. The manner of its use will appear from the following :

A few days ago Shē-gōg-doo'-chis, our chief of police, came to me for treatment for a vesical inflammation. I gave him medicine I thought best suited, and an hour later called at his tepee to see him.

I found another Indian policeman cleaning off the snow near the tepee and putting up the bent sticks that usually serve as the framework for a sweat-house. I found Shē-gōg-doo'-chis in his tepee, stripped to the breech clout, kneeling over a pan filled with water, into which had been put some hot rocks. He was thus taking a quickly improvised vapor-bath. I advised that he make his sweat-house inside his lodge, not outside, as he was preparing to do. In an hour I returned and found they had constructed a wick-i-up in one corner of the lodge. It was made just as the outside sweat-houses are made.

Stout, supple poles are stuck in the ground, bent over, and the other ends stuck in, forming a rude half sphere, some three or four feet high, and about as much in diameter at the base. This frame is covered with several thicknesses of blankets, a shallow hole is dug in the ground, a fire is built outside—in this case the usual lodge fire served—and half a dozen or more rocks, weighing four or five pounds each, heated. These are put into

¹ Abstracted from an article in the Medical Record.

² Bonneville, writing in 1833, describes them among the Nez Percés and other North-west Indians. Kirk Monroe finds them still in use among the Florida Seminoles.

the hole in the sweat-house. Four or five Indians had gathered in while the preparations were being made. These stripped and entered the sweat-house two at a time, of the first two, Shē-gōg-doo'-chis, the sick man, being one. None of the other Indians were at all sick; they were going through the process as a preventive.

The two who went in first took with them a bucket of warm water. They wore their breech-clouts. (They rarely remove this garment even to go bathing.) They poured the water over the heated rocks, and the structure was at once filled with hot vapor. Thus shut in air-tight for some five minutes, they whipped their bodies with bunches of horsehair or herbs. At the end of this time the well Indian came out, the sick one remaining and being joined at once by another well Indian, who remained with him five minutes longer, when both came out and were succeeded by the other Indians of the party, including a six-year-old boy.

When the well Indians came out they were wet with vapor and perspiration, and the skin red as a lobster and smoking like a furnace. They went at once out of the lodge into the snow, and, taking handfuls of it, rubbed themselves vigorously for five minutes. They then returned to the lodge, their bodies still red and smoking, and clothed themselves.

When the sick man came out he lay naked upon his blankets, not going out into the snow; this, however, was in deference to my presence, I having advised against it. Usually, no matter how sick, they plunge out of the sweat-house into the snow, or better, into the river, having broken a hole in the ice.

The next day the sick man was better. I saw all of the other participants, and none of them had any "cold" or other trouble. The temperature was ten degrees below zero.

Notwithstanding the harmlessness in this case, and the undoubted benefit in some cases, my decided opinion as to their serious effect on Indian health is expressed in another chapter.

The Non-Immunity of Doctors.

The impression that is abroad that doctors enjoy a special immunity from the contagious diseases that they are called upon to attend is graphically proved erroneous by the experience of the fifty doctors who went to Hamburg to assist in treating the cholera victims there. Hardly one of these doctors escaped a more or less severe choleraic attack.

Pure Air.¹

BY JOHN J. SHAW, M.D.



URING the past winter I had a very severe case of scarlet fever, which I will relate as an illustration of some points in the management of such cases.

There are two things about the case that should be remarked, and two that were remarkable. The first two were, that the boy was very sick and that he recovered; and the second two that I had a nurse who understood my directions and wishes, and who also carried them into practice.

The patient's temperature ran from 102° to 104° F., but the worst feature of the case was the condition of the mouth, tongue and throat, which were excessively inflamed and badly ulcerated. The glands of the neck were very much swollen, and a foul sanious discharge constantly issued from his mouth.

He lay in a state of semi-stupor, from which he could hardly be aroused. The nurse was fortunately the father and a man of more than ordinary intelligence. I assured him that fresh air and plenty of it was, I believed, the only thing that would save the boy's life.

There were two windows in the room, one near the foot of the bed and one near the head. Two screens were procured and adjusted so that the wind could not blow on the bed when the windows were open, and although it was mid-winter these windows were almost never entirely closed. Sometimes we would have to shut one or the other for a short time, to prevent it from snowing in too rapidly. In the meantime a thermometer was hung on the head of the bed, and never allowed to get below 68°. Thus the air was as pure in the room as out of doors; and on entering from without not the faintest odor of sickness could be perceived.

The patient hung between life and death for some days and then began slowly to improve, and made steady and complete recovery.

I do not believe this child could have recovered under less favorable conditions. It emphasizes the point that there is no antiseptic equal to fresh air. It is a common apprehension

¹ From *The Healthy Home*.

that such patients will take cold if they have too much fresh air, but the fear is entirely without foundation. I once treated a typhoid fever case in a shanty where there was no means of warming it, and where the wintry winds kept the quilts, hung up for the protection of the patient, constantly swinging back and forth, and I never had a patient do better.

When, during the Crimean war, typhoid fever seized the troops in such numbers that the hospital accommodations were wholly insufficient, many were necessarily treated in tents. It being extreme winter weather, the result was looked forward to with the gravest apprehension.

Contrary to all expectation, the result was that a much larger proportion of those thus exposed than of those well housed recovered.

Many other facts of a similar character have proved that not in theory only, but in practice as well, an abundance of fresh air is indispensable to the successful treatment of fever, and that even cold air is far safer than properly warmed air in an impure state.

A Study of the Germs of Drinking Water.¹

BY VICTOR C. VAUGHAN, M.D.,

Of Ann Arbor, Mich.,

Member of the Michigan State Board of Health.



ANY of the germs found in drinking water will not grow at the temperature of the human body. These germs, therefore, are not capable of inducing disease.

It matters not how rich a given sample of water may be in these germs, if it contains no others, it cannot be said that the water is a source of typhoid fever. The freedom of communities using such water from typhoid fever, seems to justify this conclusion. Such a water may not be, and certainly often is not, a desirable drinking water. It may be turbid with suspended matter, unpleasant to the taste, and give off a disgusting odor, but there is no evidence that it can cause disease. Several interesting examples of this kind have come under observation. One

¹ Abstracted from a paper read before the American Association of Physicians, at Washington, D. C.

of these may be mentioned. A certain city of about ten thousand inhabitants took, for a while, its public water supply from a shallow lake, the bottom of which was covered with decomposing organic matter of vegetable origin. This water was turbid, unpleasant to the taste, and gave off unpleasant odors, but none of the bacteria in it grew at 38° C. On the other hand, many of the inhabitants of the city took their drinking water from shallow wells, the water of which was clear, sparkling and palatable. The well water, however, contained germs which grew abundantly at 38° C. The use of the lake water in preference to that supplied by the wells was recommended early in the spring of 1891. Some followed the advice, others did not. During the late summer and early fall of 1891, there were more than two hundred cases of typhoid fever in the city, and at a public meeting held by the State Board of Health in this place, about the last of October, every physician in the city agreed to the statement that there had not been a case of typhoid fever among those who had used the lake water exclusively. This positive testimony of the physicians was also confirmed by the other citizens.

An Unfailing Remedy for Piles.

BY BENJAMIN SAYLOR,
Reading, Pa.



THE writer of this has been afflicted for two years with bleeding piles externally and internally, and after suffering much pain and inconvenience, trying nearly all the remedies that he could hear of, found only temporary relief, the disease returning after each trial.

I was much discouraged when I could find nothing to remove the troublesome disease.

So it occurred to me that I had seen in your valuable ANNALS OF HYGIENE that warm salt water was good for inflamed or weak eyes, catarrh of the head and sore throat, which I had used for these purposes and found invariable relief, and as the mucous membrane is the same all through the human system the same remedy might be applied wherever it could be reached. So my next remedy was warm salt water applied externally with a small

sponge with charming results. I then applied warm water with a tablespoonful of salt in solution to one-half pint water every morning internally with an ordinary syringe and found relief at once, and now find that I am entirely cured of the terrible, troublesome and annoying disease, and I shall be ever grateful to you if you will publish this remedy to the world in your valuable health journal, because thousands of afflicted people will hail it with delight.

Longevity in Japan.

The Japanese Government apparently indulge in an annual census. In the current number of the *Sei-i-Kwai Medical Journal* several tables are published showing the number and age of the inhabitants of the empire, together with the number of houses at the end of the year 1890, as reported to the Home Department, and we believe these tables are annually compiled. The population of the empire is about forty millions and a half, and there are nearly eight million houses in occupation. These and other facts are interesting; for example, in 1890 there were 325,141 marriages and 109,088 divorces; but what is perhaps more especially noteworthy is the large number of persons who have attained the age of a hundred years and upward. In one table we read that at the end of 1890 there were 81 persons 100 years of age, 40 of 101, 26 of 102, 7 of 103, 6 of 104, 1 of 105, 7 of 106 and 3 of 107. In other words, the total number of persons whose vital innings had reached "three figures" in the Japanese empire is 177, and the united ages of this "century" community yields the astonishing total of 16,937 years. These figures cannot but make us pause, always supposing that the Japanese Home Department cannot guarantee the accuracy of their reports. England, according to the census of last year, has practically about the same population as Japan, but where are the centenarians in that country? The rarity of a person reaching the age of a hundred years is so marvelous that we are accustomed to suppose that there must be in some cases a little mistake somewhere. However, the proof that the Japanese must have the faculty of longevity among them is further shown by the fact that in the aged decade, 90-99, there are, or were, living at the end of 1890, in Japan, no less than 11,245 persons; a most stupendous collection indeed is this of old individuals.

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Hawaiian Civilization.

COMMENTING on the recent troubles in Hawaii, a gentleman well acquainted with the history of that country tells us that one hundred years ago there were in the islands one hundred thousand natives of magnificent physique, strong, straight, healthy, hearty, vigorous, perfect specimens of physical manhood. European and American "so-called" civilization came among them, and to-day we find but thirty thousand natives, whose physique has been so deteriorated by the clothing, the whiskey, and the diseases of the whites that they would seem to belong to a different world from that of their progenitors. It was, we believe, American whiskey and American poker that killed King Kalakaua when he was not yet sixty years of age.

Dirty Bank Notes.

WE are in hearty sympathy with the bill that has been introduced into Congress by Mr. Outhwaite, of Ohio, looking toward the frequent redemption of national bank and Treasury notes and their exchange, at the Government's expense, for new notes. Mr. Outhwaite called the attention of the committee to the fact that dirty bank notes were the home of disease germs and to the danger of the transmission of disease by this means. We believe this to be a real danger, and earnestly hope that this bill will become a law.

A Plea for More Extended Use of Natural Mineral Waters.

THE laws of health and the laws of nature are identical ; there is nothing mysterious, nothing repugnant, nothing unnatural about the laws of hygiene ; he who is natural, with all that the word implies, is the best of sanitarians ; he who seeks to familiarize himself with the teachings of nature is working in the right direction.

Nature is a kind instructor, and he who heeds her lessons will surely profit therefrom ; commune with nature, accept her hints, obey her suggestions, make use of that which she bountifully offers to us, and good health will be our reward. These remarks have been suggested to us by a train of reflections running through our mind as to why nature has so bountifully supplied us, not only with plain water, but with so many *naturally* medicated waters that years of experience have so amply demonstrated are beneficial to the human body. And, as we think, we feel sure that we do not sufficiently appreciate the beneficence and kindly thoughtfulness, so to speak, of nature in this respect. Just reflect for a moment upon the number and variety of waters that she offers to our use. We have the actively medicated waters, with a positive curative potency, the use of which, however, we think should be indulged in only upon professional advice ; and then we have a class of what we might call sanitary waters, of waters so impregnated by nature that their regular use seems to have a most beneficial effect in preserving the integrity of functions that constitutes health.

For instance, have you ever tried drinking a bottle of Londonderry Lithia Water before or with your breakfast ? It gives you an appetite and tones you up for the day. It is for the more extended use of this class of waters that we argue. There is no cholera, no typhoid fever, no disease of any kind in such waters, and to this negative recommendation we must ever remember the positive advantage that these waters are intended by nature to do—that which we all desire—to keep the body in the best physical condition. We would earnestly urge a free use of the milder natural mineral waters as being, in our judgment, very conducive to the preservation of health.

THERE are over two millions of widows in India, and of these nearly eighty thousand are under nine years of age.

The Costume of Civilization.

HYGIENICALLY considered, the garb that is worn by the women of Eastern countries has far more to commend it than the tight-fitting, body-distorting dress of our more highly progressive nations. The loose-flowing robes are certainly much more graceful and offer much less resistance to the freedom of movement so essential to health than the garments in use in our own country.



EASTERN COSTUME.

Very few persons stop to reflect upon the mighty influence of clothing upon health, and how greatly improper apparel will interfere with exercise, even though they may recognize the necessity and importance of exercise.



FIG. 1. Effects of tight lacing, and neglect of physical exercise.



FIG. 2. The same person after a few months' training.

PROFILE TRACINGS SHOWING CORRECT AND INCORRECT
STANDING POSITIONS.

It must be evident that such loose-fitting clothing as is noted in our illustration cannot, by any possibility, distort the figure, nor interfere in any way with perfect freedom of motion.

Of course, we cannot expect American women to adopt this style of dress, but that is no reason why we should fail to point out its advantages.

With the absence of corsets and such loose garments we would find many less women with figures such as depicted in Fig. 1 and many more with the grace and vigor of health and strength, as typified by Fig. 2.

Health Resorts.

DISEASE germs innumerable and of every variety must, of necessity, be ever present in the cottage homes of our health resorts. Convalescents from every known contagious disease are hurried away from the city to this or that health resort to recuperate while yet the germs of the disease from which they have suffered are within them. These germs must find a permanent home in the cottage to which the convalescent is taken. This thought has suggested to us the necessity that exists for very complete disinfection of the houses at health resorts that are being continually rented to one occupant after another, many of them being occupied by as many as three or four different families in the course of a year.

Life-prolonging Philosophy.

A HACK-DRIVER slowly dying of cancer; the greatest philosopher of modern times; strange and incompatible as it may seem, in the first we find the second. For some months past we have had under our care a man whose occupation is that of driving a hack, and this poor man is dying of cancer. He is fully aware of his condition; he thoroughly realizes that he has but a few weeks, or, at most, months, to live; he is a good man, who has always lived a conscientious life; he has accumulated enough of the world's goods to make him comfortable; he has a large family who think only of him, and of whom only does he think; in a word, he is one of the very few persons who

is perfectly satisfied with his lot in life. Well, this poor man is continually suffering and dying of cancer, and he knows it, and, though we have been attending him for months, no one has yet heard him utter a syllable of complaint. Wonderful patience and resignation, you will say; yet it is. But where comes in the philosophy? In the reply which this humble man recently made to one of our remarks. "You are bearing your suffering with great fortitude," we recently said to him; "no one ever heard you complain." And this was his answer, which, to our mind, is the quintessence of philosophy: "What is the use of complaining, Doctor; if it would do me any good I would complain soon enough." When we remember that this sentence emanates from a man who has been for months a sufferer by day and by night from a horrible disease that he fully realizes can have but one termination, does it not put to shame those of us who are continually complaining of the trifling inconveniences of life.

This man's philosophy has undoubtedly prolonged, and will prolong, his days on earth, and so will the cultivation of a similar philosophical frame of mind prolong the lives and promote the happiness of all who strive for it.

Japanese Serenity.

IT would be well if we would turn our attention for a little while from our own affairs and see what we can learn from the experience of other nations that, because of geographical remoteness, we are not familiar with. The older we grow the more we hear, and the more we read the stronger becomes our conviction that the racial civilization of the Japanese is much more closely allied to a true, rational, beneficent civilization than it is our wont to consider it. There are many customs and habits and national characteristics among the Japanese that seem to us well worthy of careful consideration and imitation, but none more so than the national serenity that characterizes these people. It is a fact that the Japanese are a mild-mannered, quiet nation, and not at all inclined to go to extremes in anything, and, as might be inevitably expected, centenarians are most abundant. The attainment of 106, 108 or 110 years of age is so common in Japan as to cause no comment. Of course, the delightful climate has something to do with this, but we suspect that the national serenity is the most important factor.

Again, while intoxicating drinks are in common use in Japan, intoxication is an evil rarely encountered, because this very serenity of temperament saves the Japanese from any kind of excess.

While, therefore, we cannot hope for or expect that "Japanese serenity" will become an American characteristic for many years to come, we can hope and pray that individual, intelligent, thinking Americans will endeavor to cultivate the admirable trait which has so much to do with the preservation of health and the promotion of longevity.

Gladstone—Bismarck—Blaine.

THE realization of manhood," is how a recent newspaper writer defines the so-called "magnetism" of the late Mr. Blaine. And what a commentary this is upon the short-sightedness of humanity. Mr. Blaine, in his physical nature, presented a realization of the possibilities of healthy manhood, and so rare was such an exhibition that, as is always the case with the unusual, those less richly endowed, physically, were drawn irresistibly toward him. Mr. Blaine's famous magnetism was the magnetism of exuberant physical health. A thoroughly healthy man is always a popular man; his very existence is a pleasure to the rest of humanity.

Yet with his glorious physique, with his magnificent health, with the easy possibility of ninety or one hundred years of human existence, Mr. Blaine is laid to rest at 63, and why?

For the same reason that Generals Grant, Sherman and Sheridan, that Colonel Thomas A. Scott and a host of distinguished Americans have left us long before they had any business to do so.

And this reason is that with all our boasted intelligence, with all our material progress, with all our self-satisfaction, Americans do not know how to live. We are experts in the art of working and dying, but we are but the merest tyros in the art of living.

"Bismarck in Germany, Gladstone in England, Blaine in America—the world's three greatest civic men of the last quarter century," is the way it is put by one of our newspapers, and is it not sad to think that of this trio the one to go at an age so greatly less than that at which the other two are vigorously alive should be the American? Was it chance that so ordered it? Was it chance that killed General Sherman at the same age at

which General Von Moltke reached the zenith of his fame? Was it chance that carried off Generals Grant and Sheridan while their parents yet lived? Was it chance that terminated the career of ex-President Hayes at 70, and allowed the Emperor William to fade away at 92? Was it chance that caused the death of Mrs. Harrison at an age less (by more than thirty years) than that of her then living father, and allows Queen Victoria to waddle around at 75? Was it chance that killed our own beloved Dr. Agnew at 73, and allowed the French chemist, Chevreul, to live a life of comfort for 102 years. No indeed; there is no chance about it; these comparative illustrations, that could be indefinitely multiplied, point only too clearly to the fact that while, as a nation, our material progress has never been equaled in the history of the world, this progress has been, and is being, achieved by the sacrifice of ourselves as individuals.

During the sixty-three years of his earthly existence, Mr. Blaine contributed a certain definite amount of work toward the development of his country; had this amount of labor been spread over ninety years, and had such a custom been universal, the country would not have developed so rapidly, it is true, but the individual would have had a longer lease of life.

The question, to us, seems something like this: Do you care more for the rapid development of your country than you do for the prolongation of your own life? Is your chief aim in life to secure the greatest possible material progress for the nation of which you are a unit, to be forgotten when you are no longer of any use? If so, then work night and day, convert all the force that is within you into national steam, fill the public boiler to the point of bursting, hear the plaudits of the masses for a few short years, then explode and have a monument erected to your memory. But if, in addition to a reasonable "*amor patriæ*," you find that there is some pleasure, personally, to you in life; if you feel that each hour added to the companionship of your family and the intercourse of your friends is a time of happiness, then go slowly—bank your fires, lessen the pressure in your boiler, contribute moderately to the progress of the nation whose love for you is but skin-deep, and aim to prolong the days of your intercourse with yourself and all others to whom your existence alone is a pleasure, irrespective of what you may be doing for the so-called material progress of the masses.

According to the laws of nature Mr. Blaine should have been

alive and well for thirty years to come. In the vigor of health he heedlessly willed it otherwise; when too late, he would have retraced his steps. Thoroughly American in everything, his disregard of self and health made him no exception to the rule of his countrymen. The Englishman may have his objectionable characteristics, but he certainly knows how to so live that he may prolong his life to its utmost limit, and, while living, that he may derive all possible enjoyment therefrom. Let us hasten the day when, as a nation, we will learn to do likewise.

NOTES AND COMMENTS

Tree Planting in Paris.

Few people have any idea of how much money is spent by the municipality of Paris in planting and looking after the trees which line the principal boulevards and avenues of the French capital. The annual report of the superintendent gives the total number of trees planted at 87,655, each of which represents an initial cost of \$35. The annual expenditure for maintenance costs \$50,840.

Good for the Complexion.

To keep the complexion and spirits good, to preserve grace, strength and agility of motion, there is no gymnasium so valuable, no exercise more beneficent in its result, than ordinary housework, the sweeping, dusting, making beds, washing dishes, and the polishing of brass and silver. One year of such muscular effort within doors, together with regular exercise in open air, will do more for a woman's complexion than all the lotions and pomades that were ever invented. Perhaps the reason why housework does so much more for women than games is the fact that exercise which is immediately productive cheers the spirit. It gives women courage to go on living and makes things seem really worth while,

Vaccination.

Apropos of the preventive power of vaccination, it is a noteworthy fact that not a single case of smallpox occurred during the year 1890 in the British army. If this be not evidence of the protection afforded by revaccination against a malady once so common—and still so disastrously fatal in armies where this precaution is not vigorously enforced—then logic and reason are mere accomplishments.

The Costume of Our First Parents.

According to the *Medical Record* a curious Jewish tradition reports that Adam was entirely clothed in a hard, horny skin, and only lost it and became a subject to evil spirits on losing Paradise. The nails are the remnants of this dress, and whoever cuts them off and throws them away does himself an injury. An old Persian chronicle says that Eve also possessed this dress, and the nails were left to remind them of Paradise.

The Disposition Made of the Dead in Various Countries.

According to *Progression* the Mohammedans always, whether in their own country or one of adoption, bury without coffin or casket of any kind.

During the time of the old Roman empire the dead bodies of all except suicides were burned.

The Greeks sometimes buried their dead in the ground, but more generally cremated them in imitation of the Romans.

In India, up till within the last few years, the wife, either according to her wishes or otherwise, was cremated on the same funeral pyre that converted her dead husband's remains into ashes.

When a child dies in Greenland the natives bury a live dog with it, the dog to be used by the child as a guide to the other world. When questioned in regard to this peculiar superstition, they will only answer, "A dog can find his way anywhere."

The natives of Australia tie the hands together and pull out their nails; this is for fear that the corpse may scratch its way out of the grave and become a vampire.

The primitive Russians place a certificate of character in the dead person's hands, which is to be given to St. Peter at the gates of heaven,

Recently Slacked Lime as a Disinfectant.

Dr. George M. Sternberg, than whom there is no higher authority on the subject of disinfection, tells us that some experiments recently conducted in Germany show that recently slacked lime is a very potent disinfectant. The cholera spirillum and various other micro-organisms in the dejecta of patients are all destroyed by a freshly-prepared milk of lime, and recently slacked lime thrown into urinary vaults or cesspools is one of the cheapest and best methods of disinfection.

Parisian Ice.

The ice in Paris is to receive more attention from the health authorities than it has had hitherto. It has been forbidden to cut ice from, or to make ice artificially from, the water of the Epinay-Enghien basin, a pool connected with the river Seine and receiving from it the greater part of the sewage of Paris. Strange to say, much of the ice supply of Paris has been derived from this source. The health authorities have also appointed ice inspectors, who will from time to time make analyses and bacteriological examinations of various specimens of ice obtained from the dealers.

Diphtheria and Faulty Drainage.

Dr. P. F. Harvey relates the case of an army officer who had not been exposed to any known source of contagion. The case proved to be very malignant and terminated fatally by heart paralysis after about eight days' progress. One week later the patient's wife developed a fatal attack. The disease originated *de novo* at an isolated military post in a new brick building. The location of the post was high and dry on a plateau between the confluence of the Mississippi and Minnesota Rivers.

A thorough sanitary inspection of the house was made, and a faulty drain was found in the basement, with some leakage of sewage into the earth at that point. Here, then, was the explanation of the origin of the disease, and a demonstration how rapidly the diphtheritic poison may be formed under circumstances favoring its evolution, as the cases occurred in January and the premises were first occupied the preceding November.

Damp-Proof Masonry.

Coal tar, according to *Architecture and Building*, will render masonry impervious to water, especially when exposed to direct contact therewith. The coal tar is employed in a boiling state, in one or more layers, or it may be made to flame up before being used, the first being suitable for surfaces exposed to the air, while the second is appropriate in the case of parts intended to be covered up. This method of treating foundations is declared to be of special utility in all public buildings, particularly those designed for the preservation of works of art, preventing, as it does, exudations of water charged with lime salts from the mortar.

The Cause of Nervous Exhaustion.

It is not natural and reasonable intellectual work, says the *Herald of Health*, that injures the brain, but emotional excitement. Most men can stand the severest thought and study of which their brains are capable and be none the worse for it, for neither thought nor study interferes with the recuperative influence of sleep. It is ambition, anxiety and disappointment, the hopes and fears, the loves and hates of our lives that wear out our nervous system and endanger the balance of the brain. A man can spend more of his strength in five minutes of unnatural mental excitement than in a day of calm, steady brain work.

Infection and Filth.

Dr. Chas. C. Partridge strikes a note that cannot be too much played upon, when he calls attention, in *The Healthy Home*, to the relationship of infection and filth. The doctor is about right when he argues that the average mass of humanity is ignorant of the elementary laws of hygiene, and he makes a really inestimably valuable suggestion when he counsels that the "gospel of cleanliness" should be made clear to the children at school, and that they be requested to see to it that it be regarded at home. Undoubtedly, ignorance is at the bottom of much disease, and the most urgent necessity of the day is *universal* dissemination of the elementary doctrines of healthy living, now conferred to a comparatively small number.

The Cow as an Enemy of Mankind.

From the *Medical Record* we learn that in a discussion on tuberculosis in Chicago recently, Dr. Robinson said that the death of babies who are fed by cows' milk is due to germs, and among these germs the tubercular bacillus plays a rôle. He said that it appeared to him that the home of the tubercular germ is in the cow, and that the bovine family is where the bacillus of tuberculosis finds its native living-ground. He believed that man gets the tubercular germs from this animal. If the people who have no cows are studied it will be found that they have less tuberculosis. The people who use the milk of the reindeer, or the buffalo, or the goat will be found with less tuberculosis than those who use the cow. The history of the association of man with the cow is, the speaker thought, the history of tuberculosis in man.

How to Judge the Quality of Condensed Milk.

The general appearance when poured from a spoon should be glossy; the more glossy the better (*Scientific American*). It should be ropy or stringy like very heavy syrup.

The color should be that of cream, but the color varies according to the season of the year in which the milk is condensed, the same as milk not condensed varies in color. Milk is more yellow in summer, when cows are on pasture, than in winter, when they are fed on dry hay.

Thickness varies with age. Thickening by age is natural to condensed milk; rapid thickening only proves that the milk is preserved in the best manner and retains in the highest degree the characteristics of milk in its natural state. The thickest condensed milk, if in sound condition, is the most valuable. There is a degree of thickness, however, that is inconvenient. If condensed milk is so thick that it will not run out when an open can is inverted, it is troublesome to dissolve. If it is not actually hard, very little stirring in the can will render it sufficiently liquid for convenient use.

Condensed milk, if properly done, does not destroy cream globules, but leaves the constituents of milk unaltered and natural. One method, therefore, of determining the relative quality of different samples of condensed milk is to ascertain the amount of butter that can be made from each.

Directory of Resorts for Whooping-Cough.

Dr. J. H. Musser, in a paper read before the American Climatological Association last year on whooping-cough, makes a most valuable suggestion which seems to us worthy of the attention of the committee having in charge the Directory for Nurses. He refers to the difficulty of finding accommodations in the country, at the seashore and elsewhere, for patients suffering with whooping-cough, and his suggestion is that a central bureau should be formed at every city at which could be registered the addresses of those who would be willing to receive such patients.

A Beautiful Nose.

According to the rules of art the following are the conditions requisite to the beauty of this organ: The nose shall have the same length as the forehead, and have a slight depression at its root or apex. From its apex to its base it should follow a perfectly straight line and come exactly over the center of the lower lip. The bridge, bounded by parallel sides, should widen slightly in the center. The tip should be neither too thin nor too fleshy, and its lower outline neither narrow nor too wide. The lobes must be gracefully defined by a slight depression. Seen sideways, the lower part or base of the nose will have but a third of its total length. The septum should divide the nasal cavities into two even parts, and the nostrils—rounded anteriorly, arched in the centre and tapering posteriorly—should be exactly similar.

Disinfection of Rooms.

The question is often asked whether articles that will be damaged by the disinfectant agent may be removed from a room, where contagious sickness has been, prior to the process of disinfection, and we answer this query with the words of *Good Health*, that in the disinfection of rooms everything which has been in the room during its occupancy by a case of infectious disease should remain during the disinfection; all pictures, upholstered furniture, organs, and similar articles, which are likely to be injured by a fumigation should be removed before the patient is put into the room. An organ would doubtless be utterly ruined by the fumigation, as would also an ordinary gilt picture frame, as the sulphur

fumes would attack the metal reeds, and would be likely to take all the gilding from the picture frames. Such articles may be disinfected by other means, as for example by wiping with a five per cent. solution of carbolic acid or a 1-2000 solution of corrosive sublimate. Corrosive sublimate will discolor metal articles with which it is brought in contact; it can be used only for wood furniture or varnished surfaces.

The Mortality of War.

In the past century, says the *Medical Record*, it is estimated that over nineteen million persons have been killed in the wars of civilized countries, and twelve hundred millions during the last thirty centuries. Flammarion, the astronomer, makes some curious calculations regarding this mortality rate. The blood of the victims would amount to eighteen million cubic metres. This quantity of blood weighs 18,900,000,000 kilogrammes. It is an unfailing stream, which every hour since history began has unceasingly poured six hundred and eighty litres of blood to dye the royal purple worn by the occupants of imperial thrones. If the 1,200,000,000 skeletons should rise and climb one upon another the ladder thus formed would reach the moon, coil about that body, and, continuing onward, would mount into infinite space four times as far again, that is, 500,700 leagues in height. The corpses, if thrown into the channel at Calais, would form a bridge between France and England and separate the ocean from the North Sea by a weir. If only the heads of the men slaughtered in war were taken and placed side by side, a band would be formed reaching six times round the world.

Tobacco Smoking Among Boys.

As long as the habit of tobacco smoking remains a common practice among men (says *The Lancet*), so long may we expect that the boyhood of the time will acknowledge its fascination. It is, therefore, in a sense as natural as it is morbid that the soothing weed should be numbered among the mischievous absurdities of growing youth. This is much to be regretted for several reasons. Constitutionally, the boy is not even a lesser man. Between his young and vigorous nervous system and that of the male adult, there is this essential difference—the one is

developing, the other formed. Endowed with greater elasticity, the former is also in proportion less stable, and such effects as the narcosis of tobacco cannot at all assist, but must more or less pervert, its normal activity. The man's more settled nerves are less affected. Then with boys the smoking habit is, in its way, a first love, and as such is almost certain to be indulged to excess. The circulatory and nerve structures are overworked in consequence, digestion suffers, and whatever may survive of physical energy, we have often to note a decrease in constitutional soundness.

Hospitals for Infectious Diseases.

The Willard Parker Hospital, in New York City, is where the diphtheria and scarlet fever cases are sent by the Board of Health, and this is how these cases are handled from the disinfectant point of view: As far as possible, the convalescent and doubtful cases are separated from those having true diphtheria; but owing to the frequently crowded condition of the wards, this often cannot be done. The floors are of hard wood, and are washed daily with 1:1000 bichloride solution. The iron bedsteads are carbolized each morning. Where patients soil their beds the sheets and spreads are changed daily; in other cases, weekly. All patients have their nostrils and throats syringed with a 1:4000 bichloride solution, the bad cases every half hour, the convalescents three times a day. No swabbing of throats is allowed. All clothes brought to the hospital are disinfected, and are only returned when patients leave. Patients are also required to take a bath when they go (also if possible, when they come), washing the hair with a 1:1000 bichloride of mercury solution.

The Distribution of Diphtheria in Massachusetts.

Dr. S. W. Abbott, the secretary of the Massachusetts State Board of Health, thus formulates his conclusions on this subject:

- (1) That diphtheria is an eminently contagious disease.
- (2) That it is infectious, not only by the direct exposure of the sick to the well, but also through indirect media as clothing and other articles that have come in contact with the sick.
- (3) That the certainty of infection is not so great as in the case of some of the other infectious diseases, notably smallpox and scarlet fever.

(4) That overcrowding, faulty ventilation and filthy condition of tenements favors its spread.

(5) That the influence of defective plumbing is not proven.

(6) That its transmission through public and private water supplies is not proven.

(7) That its propagation is favored by soil, moisture, damp cellars and general dampness of houses.

(8) That the poison may remain dormant in houses for a long period.

Round Shoulders.

Even the best natural figures will often show a tendency toward round shoulders unless some care is taken to prevent it, especially if the work done is of such a nature as to keep them sitting at a desk all day, bending over a machine, or doing many kinds of housework; while thin, narrow-chested women are very likely to stoop before middle age (says the *Phrenological Journal*).

In those countries where it is the common habit of the women to carry burdens on their heads, straight forms and beautiful shoulders are seen among the youths of the poorest class. A very simple exercise is helpful toward straightening and strengthening the trunk, viz.: that of raising one's self upon the toes leisurely in a perpendicular position several times daily. To do this one must be in a perfectly upright position, with the heels together and the toes at an angle of about 45° , the arms hanging by the side. Inflating and raising the chest to its full capacity is a part of the exercise, a process which the lungs soon begin to show.

To exercise all the muscles of the legs and body one must rise very slowly on the balls of both feet to the greatest possible height, and then come again into standing position without swaying the body out of its perpendicular line. This may be accomplished by patience and perseverance. After a while the same method may be tried on one foot and then on the other.

In order to prevent round shoulders in school children, teachers should never ask them to fold their arms in front, but rather to place them behind the back, which occasionally is good practice, giving as it does the fullest expansion to the upper part of the body. Much more care is taken now than formerly to see that children sit properly, with the spine kept straight and chest expanded.

Street Cleaning in London.

Some idea of the problem that is to be met in such a gigantic aggregation of humanity as the city of London may be gained from the recent report of Col. Haywood, the engineer to the city of London Commission of Sewers, wherein we read that the number of persons entering the city on one day of last year was 1,186,000; that of vehicles, 92,000. We learn from it also that in order to maintain due cleanliness all carriage-ways have to be swept daily, once at least. Some 150 boys are in constant employment as street orderlies. Many thoroughfares are cleansed by means of the water-hose, a total volume of about 3,500,000 gallons of water having been expended last year in the process. The cleansing of slums is a daily charge upon the authorities, and the total mass of refuse of all kinds removed during the year amounted, it is said, to 71,055 van loads. Such facts as these will assist us in forming a judgment, however imperfect, respecting the properties of street dust. In view of their teaching, we can have no doubt as to the importance of securing effectual ventilation by the demolition of insanitary hovels and tenements, and the construction of wide thoroughfares. The work of daily cleansing becomes evident as a matter of mere necessity, and the water cart or hose gains a new importance as a means of laying the pulverized refuse, laden as it must be with putrefying matter.

The Mortality of Races.

Stillman, in his work, *The Insurance Examiner*, gives us the following interesting and valuable information :

Of the whole mortality in over 5000 cases, those born in the United States give 75 per cent.; Germany, $9\frac{1}{2}$ per cent.; Ireland $4\frac{1}{2}$ per cent.; England, $4\frac{1}{3}$ per cent.; Scotland, $4\frac{1}{4}$ per cent. Total United States, 75 per cent.; foreign born, 25 per cent. The fact of nativity seems to have very little influence on the *cause of death*, there being but slight variation from the 75 per cent. for most of the diseases. The following are exceptions :

In typhoid and malarial fevers, diarrhœa, cholera and pneumonia the percentage of the United States rises to 80, and in cancer, alcoholism, dropsy and peritonitis it falls below 70 per cent.

Alcoholism.—The deaths from this cause are chiefly among foreigners in the following order: England, Ireland, Scotland and Germany.

Consumption.—Varies considerably. It gives the largest proportional mortality among the natives of Ireland and the smallest among the English.

Apoplexy gives the largest percentage among the Scotch, and the smallest among the Irish. The same ratio is true among nervous diseases generally.

Cancer.—The foreign born gives a much higher mortality from cancer than native Americans—35.17 per cent. instead of the usual average of 25 per cent. Among foreigners the Germans give the highest proportion and the Scotch the lowest.

Heart Disease prevails uniformly among different nationalities.

Digestive Diseases.—Ireland gives the largest percentage for diseases of the stomach and the smallest for diseases of the bowels.

Kidney Diseases are more fatal among the Scotch.

Accidental deaths occur equally among all races.

Suicides are equally frequent among the native born, the Germans and the English. The Irish and Scotch afford very few instances.

The Benefits of Public Health Service.

In our issue for December we called attention to the fact that in deciding as to the efficacy of hygienic measures, individual experiences must be always subordinated to general deductions, and we can now point this statement by referring to some striking statistical facts. Premising that England is a country in which the doctrines of hygiene have been observed for many years, and Italy a country wherein, until recently, they have been neglected, let us look at the relative mortality of these two countries, as furnished by Mr. Lord, in the *Nineteenth Century*.

The comparative number of deaths from scarlet fever in Italy and England, the population of the two countries being about the same, is 2 to 1; diphtheria, $3\frac{1}{2}$ to 1; typhoid fever, 5 to 1; malarial fever, 100 to 1; cholera, 7 to 1; and smallpox, 32 to 1.

In the above statement the number of deaths in England from each of the causes mentioned is taken as 1. The average would be 25 to 1. In other words, the risk of dying from a contagious or infectious disease is just twenty-five times as great in Italy as it is in England. The lesson taught by the above facts is too obvious to require emphasis.

The Insanitary Condition of Rouen.

The Paris correspondent of *The Lancet* writes anent the occurrence of cholera in Rouen, the following: "To sum up, only one house out of five—3000 out of 15,000 houses—has a supply of wholesome drinking water; only one cesspool out of three cesspools has any pretence to be water-tight; more than 10,000 cesspools allow their foul liquid contents to escape in the subsoil; out of 162 kilometres of streets only 42 kilometres of streets have sewers. Many of the streets are devoid of sunlight. The sewers—the surface drainage—poison the confined atmosphere. What wonder that the infant mortality is the largest in France, and that the general mortality reaches the alarming figure of 35.32 per 1000 of the population. What wonder that typhoid fever is endemic, that diarrhoea has assumed an epidemical intensity, and that cholera has found in Rouen ready victims. May the mischief go no further, and may the warning be taken in time. Good water is available, good drainage is possible; both should be at once secured."

Unchristian Resignation.

In spite of the published prohibition, it is reported that in some parts of Russia they continue, in the churches, to recite the funeral prayers over the open coffins of the victims of cholera. The practice of what is thought to be religion, and the neglect of precautions that are dictated alike by common sense and by religious motives, are unfortunately only too often to be found going hand in hand. When the pious peasant woman, in the time of an epidemic, was remonstrated with on account of the dirtiness of her house, she replied, with what might be thought by many a fine expression of trust, that God sent the cholera where he willed. True, was the response, and yet it was worth noticing that God willed to send it chiefly to the dirty houses. It is pure fatalism to offer up prayers, and to make no effort for the warding off of disease. Some of the plainest moral lessons take a long time to learn; and one of these is that the feeling of good citizenship and the spirit of true Christianity unite in demanding that each one shall do all in his power to ensure that infectious disease shall be kept as far off as possible. Prophylactic and preventive measures are within the reach of all; the neglect of them may cause untold misery, and it is more a sacred duty to try to shield our neighbor from the attacks of disease than to offer up funeral prayers after he is dead.—*The Sanitary Record*.

Germ-free Water.

Drs. V. and A. Babes have made a number of experiments to determine the best method of purifying water for drinking purposes (*Centralblatt für Bacteriologie*, July 30, 1892). Filtration, they claim, is not only useless as far as removing the micro-organisms is concerned, but actually favors bacterial growth. Alum has been found by them the best, not only for clarifying water, but also for purifying it. Powdered alum is added to water, which is then well shaken and allowed to stand twenty-four hours in a cool place. At the end of this time the water is not only clear but quite free from germs. The addition of alum in large quantities is harmful, since it leads to digestive disturbances. About ten grains to the gallon is amply sufficient to accomplish the desired end. After four or five days' use the vessel is emptied, washed out with sterilized water, and refilled. Water can also be rendered free from germs by the addition of sulphate of iron or of chalk powder and sulphuric acid; in the latter case carbonic acid is given off.

Keeping Cholera Out of Cuba.

The Cuban health officials have a wholesome dread of cholera, as great perhaps as that of the dwellers about the Great South Bay, and they were determined that the disease should not get at them by way of New York. In September last a steamer left New York with a clean bill of health for Cuba. When she arrived, a week later, at Guantanamo, the health officer of the port rowed within hailing distance and shouted out to have the passengers and crew mustered up on deck. He counted them and had them sent below, and then came near enough to the ship to get the bill of health. This he sprayed carefully with carbolic acid and then read it to see if it tallied with his count. Then he went away leaving the vessel in quarantine. At the end of four days he ventured aboard, fumigated the boat and sprayed each passenger and member of the crew with carbolic acid. After this he boldly released the ship. From this port the ship went to Santiago. There the ship was fumigated and the passengers and crew were made to march around a pot of burning sulphur on deck. After leaving Santiago the vessel proceeded to Cienfuegos and there was fumigated and sprayed again. Then she came back to New York, and Cuba was left with her yellow fever all alone.

Simple Tests for Impurities in Water.

According to the *Pharmaceutical Era* the following methods of determining the presence of impurities in water are given by Walling:

(1) For organic matter put a little of the sample into a beaker, add two or three drops of dilute sulphuric acid, and color distinctly with a solution of permanganate of potassium. If much organic matter is present the color of the permanganate becomes discharged almost immediately; if less or very little, it takes longer to decolorize. If the color has not changed in twenty-five or thirty minutes it is safe to assume that organic matter was not present. This is a tolerably reliable test.

(2) For nitrates a little sulphuric acid added to the water forms nitrous acid if nitrites are present, which is easily detected by its power of liberating iodine from iodide of potassium. A little starch paste is mixed with a small quantity of a solution of potassium iodide, and the mixture added to the suspected water containing the sulphuric acid. If nitrites are present the nitrous acid formed liberates the iodine from the iodide, which turns blue with starch. This indirect method is a ready means for detecting the nitrites if present in not too small a quantity.

(3) Nitrates are detected by converting into nitric acid, which turns morphia red. A portion of the water is evaporated to dryness, the residue treated with a drop of strong sulphuric acid (which makes nitric acid of the nitrate), and a portion of morphine added. If nitrate is present the morphine gives red color.

(4) For ammonia Nessler's reagent is by far the best test. It may be made by dissolving eighteen grains of oxide of potassium in a little water, adding solution of mercuric chloride until the red iodide of mercury first formed redissolves upon agitation. To this is added a solution of fifty grains of caustic potassa and distilled water to make eight ounces. This reagent will detect 0.00375 of a grain in a pint of water by giving a yellow color. A reddish color or precipitate forms with larger quantities of ammonia.

(5) Albuminoid matter requires a more elaborated proceeding for its detection. If all of the above were found it is hardly necessary to go to the trouble of looking for albuminoids; the water would be unwholesome even if they were not present.

Insanitary Kitchens in Paris.

Foreigners who enjoy the occasional luxury of a dinner at a fashionable Paris restaurant little dream of the unhealthy, not to say disgusting, surroundings of the myrmidons whose duty it is to prepare the appetizing viands sent upstairs, says the Paris correspondent of *The London Lancet*. A peep at the kitchen in too many celebrated establishments would assuredly have the effect of dispelling the appetite of even a burly Yorkshire farmer. That I do not exaggerate is abundantly proved by the report just made to the Conseil d'Hygiène de la Seine by M. Deschamps. This report is based on the investigations of Drs. Calendreau and Regeard, medical officers to the Société des Cuisiniers de Paris. Dr. Regeard says of these kitchens that they are, in fact, the foulest rooms in the house—airless, because the ventilators are kept closed to avoid odors in the dining-rooms and in neighboring houses; often also deprived of any other than gas light. The water-closets are generally in direct communication with the kitchen, and, in many instances, access to them being forbidden during the busy hours of the day, the cooks are compelled to utilize preserved fruit and vegetable boxes as urinals. All the above details are sufficiently disgusting to the customer, but the report would be incomplete were no reference made to the disastrous effects of these insalubrious conditions on the health of the men who pass their lives in these dirty holes. Dr. Calendreau tells us that, in addition to infirmities such as varicose veins, varicocele and hernia, which are peculiar to the calling, cooks suffer from the following maladies: (1) Rheumatic pains from damp, absence of fresh air and light; (2) sore throat and bronchitis, due to exposure to draughts and excessive heat, with consequent indulgence in iced beverages; (3) dyspepsia and alcoholism; (4) pulmonary phthisis. The foregoing list explains the high mortality prevailing among this numerous class. The remedy proposed for this deplorable state of things is as follows: No restaurant kitchen to have dimensions less than, length, 3 metres; breadth, 2 metres 50 centimetres; height, 2 metres 80 centimetres; every kitchen to be independent, for air and light, of small courtyards; the kitchen to be separate from the scullery; the floor to be waterproof; the larder to be isolated; urinals and closets to be quite apart from the kitchens; the suppression of bedrooms in proximity with the kitchens.

SPECIAL REPORTS

State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania.

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S. T. DAVIS, M.D., of Lancaster.

HOWARD MURPHY, C.E., of Philadelphia.

BENJAMIN LEE, M.D., of Philadelphia.

PLACE OF MEETING,

Supreme Court Room, State Capitol, Harrisburg, unless otherwise ordered.

TIME OF MEETING,

Second Thursday in May, July and November.

Eighth Annual Report of the Secretary, Benjamin Lee, M.D.

Hon. Samuel T. Davis, M.D., President State Board of Health of Penna.:

SIR: I have the honor to submit the following report of the work of the Board and of my official acts during the past year. The Board has held three regular and eight special meetings. The regular meetings took place on November 12, 1891; May 13 and July 11, 1892. The special meetings were held on February 23, March 23, June 29, August 13, September 3, September 16, September 21 and September 22, 1892.

At the first of the regular meetings held November 12, 1891, a communication was received from the Trustees of the University of Pennsylvania announcing the approaching opening of its new

LABORATORY OF HYGIENE,

whereupon the following resolution was adopted:

Resolved, That this Board has received with sincere satisfaction the formal announcement of the approaching opening of the Laboratory of Hygiene of the University of Pennsylvania, considering that this event marks an era in the progress not of science only, but of civilization in this State.

Resolved, That the Secretary be instructed to communicate with Dr. William Pepper, provost of the University, and with Dr. John S. Billings, Director of the Laboratory of Hygiene, suggesting a conference for the purpose of formulating a plan by which this Board may avail itself practically of the facilities to be afforded by the laboratory for the investigation of disease, and of the means for its prevention; for the analysis of foods, water and other beverages, and for bacteriological studies.

Resolved, That in a definite co-operation between the University and the State Board of Health, in the prosecution of such researches, this Board

recognizes an opportunity not only for mutual aid, but for advantage of the greatest moment to the entire Commonwealth.

In accordance with the above resolution such a conference was held, and your Secretary was requested to take part in the opening exercises of the Institute, which took place on the 22d of February, and which were formally attended by the Board, called in special session for the purpose.

The necessity of a Laboratory of Hygiene to the State Board of Health has been urgently felt, and arises out of the duties imposed upon the latter by Section 5 of the Act of Assembly establishing it, which reads as follows :

“The State Board of Health and Vital Statistics shall have the general supervision of the health and lives of the citizens of the Commonwealth, and shall especially study its vital statistics. It shall make sanitary investigations and inquiries respecting the causes of disease, and especially epidemic disease, including those of domestic animals, the sources of mortality, and the effects of localities, employment, conditions, habits, food and medicine on the health of the people. It shall also disseminate information upon those and similar subjects among the people. It shall, when required by the governor or the legislature, and at such other times as it deems important, institute sanitary inspections of public institutions or places throughout the State.”

Now, to carry out in any adequate degree the purposes of the law with regard to investigating the causes of disease, and the effects of foods, beverages and medicines on the health of the people, two things, among others, are absolutely essential. First, that the Board should have means and opportunities for making or procuring chemical analysis; and, secondly, that it should have means and opportunities for prosecuting what are now known as bacteriological examinations—the study of the germs of disease. And it goes without saying that where the interests of the health and lives of five million people are concerned these means and opportunities should be on a generous scale, and should conform to the most recent developments of scientific hygienic research, both in this country and Europe. It does not at all meet the intention and requirements of the statute that the Secretary of the Board should spend a few cents on test tubes and chemicals, or press his old Dolland microscope, handed down from a previous generation, into the service of the State. Nor is it fitting that this great Commonwealth, with its millions of revenue, should be depending, as it has done, on the charity of private chemists, who have, in a spirit of generous patriotism, placed their services at the disposal of the Board in order to enable it, in some slight degree, to meet the claims that are constantly and properly made upon it for the analyses of suspected waters and foods. It is hoped, therefore, that the trustees will see their way clear to allowing the Board to refer applications of this kind to the laboratory for investigation. The Board, for its part, should make every effort to obtain from the legislature a reasonable appropriation for such purposes, distinct from the general appropriation, which will enable it to meet, at least, the cost of all work done for the State.

Further, Section 9 of the Act creating the Board, instructs it “from time to time to engage suitable persons to render sanitary service, or to make or supervise practical and scientific investigations and examinations requiring expert skill, and to prepare plans and reports relative thereto.”

Observe the phrases, "suitable persons" "expert skill." Heretofore the Board has been compelled to call to its aid for these objects simply medical men—intelligent, educated, sound practitioners, but without that special training and equipment which would render them "suitable persons" in any strict, technical construction of the expression, or would furnish them with "expert skill." Here, again, the laboratory will prove the right hand of the Board, giving just that instruction which a sanitary inspector needs to fit him for his special work. And, on its side, it should be the purpose of the Board to pursue more persistently even than it has in the past the purpose of obtaining a thorough sanitary organization of the State under legislative sanction and compulsion, the result of which will be to create a constantly increasing demand for just such trained practical sanitarians as this school will graduate. In this view of the case it might be the part of wisdom for the trustees to place a certain number of scholarships at the disposal of the Board.

Finally, it is desirable that publicity should be given to the important work which will be carried on in this institute, which your Secretary risks nothing in saying, after a careful inspection, and after comparison with other similar laboratories, will be in advance of any in this country and the peer of any abroad. It is highly desirable that this work should be frequently brought to the notice of the legislature, the medical profession and the public, and I therefore suggest that its director be requested to present a stated report quarterly, or at such other interval as may be deemed expedient to the State Board of Health, of all investigations here prosecuted directly in the interest of the public health, which report shall form a portion of the annual report of the Board, to be transmitted to the governor, and of which a certain number of reprints shall be furnished to the trustees for general distribution as well as for preservation in the archives and various libraries of the University.

EPIDEMIC AND CONTAGIOUS DISEASES.

During the year there has been rather an unusual prevalence of preventable diseases. Smallpox has appeared at several points, but has been carefully isolated either by the State Board or by local boards, and thus prevented from becoming epidemic. Scarlet fever has been unusually prevalent, but of a mild type. Diphtheria, however, has been widespread and extremely fatal. It is safe to say, comparing the returns of our cities with those of previous years, that this disease has been at least five times more prevalent than ever before.

During the past few weeks, in the city of Philadelphia, it has reached at least ten times its average death rate. It is evident that the only way to deal with this virulent contagion is to adopt the same rigid restrictions with regard to isolation, disinfection and destruction of fomites that we have long insisted on for repression of smallpox.

The manner in which the Board deals with that disease in rural districts, which are unfortunately denied the protection of local health authorities of any kind, is fairly illustrated in the management of an outbreak of

SMALLPOX AT POINT PLEASANT.

(1) Smallpox having been reported at Point Pleasant, Bucks County, on the 15th of November, 1891, Professor William B. Atkinson, M.D.,

medical inspector for the Delaware District, was at once dispatched to make an investigation. Under instructions from the Secretary, he placarded the house in which the disease existed, called a public meeting of the residents, and, with the assistance of Dr. A. M. Cooper, a resident physician, appointed sanitary, quarantine and finance committees. Day and night guards were established, and Dr. A. M. Cooper was commissioned by the Secretary deputy medical inspector of the Tinicum sub-district, including the townships of Tinicum, Badminister, Plumstead, Buckingham and Soleberry, with full authority to inspect and enforce quarantine. Dr. Alexander, of the Lancaster County Vaccine Farm, was notified to send two hundred points of virus to Dr. Cooper and other physicians in the neighborhood.

The disease was confined to the first case, an Italian, who had come from Trenton, N. J., and an infant in the same house. The authorities of Doylestown were communicated with and recommended to urge the citizens to have vaccination performed.

The chairman of the directors of the poor of the county was notified that it was their duty to provide for the necessary expenses of nursing and quarantine, and, should new cases occur, to have them quarantined in the county pest-house.

The following is the letter of instructions to the Medical Inspector :

DR. WILLIAM B. ATKINSON, Medical Inspector Delaware District,

SIR : In making your inspection at Point Pleasant your first duty will be to see Dr. Cooper, if possible, then to visit the house and placard it, after verifying the diagnosis. The more influential citizens should then be assembled, and sanitary, finance and quarantine committees appointed. The sanitary committee will have charge of cleaning up and disinfecting throughout the town, and of vaccination. The State Board of Health will furnish virus, but can assume no other expenses. The quarantine committee will appoint day and night guards, and must allow no one to go in or out of the infected house except the physicians. They will provide food and medicines at the expense of the village if the family of the patient or patients cannot afford it, for all quarantined persons, who will make known their needs through a selected spokesman by word of mouth, no letter or other piece of paper being allowed to pass outside the lines. A vacant house should be selected, to which those exposed in the infected house, but not sick, can be removed for observation, only those necessary for the care of the patient remaining. Persons thus under observation should be detained eighteen days. In case of one of them being taken sick with this disease, or any other person in the village being so taken sick, such person must be removed to the house in which the present case now is, which will be the quarantine hospital. If, however, there is a smallpox hospital connected with the County Almshouse, it is the duty of the directors of the poor to have all new cases removed to that building and properly cared for at the expense of the county. All persons known to have been exposed to the contagion must be vaccinated first, and later the entire population.

The finance committee will proceed at once to raise funds to meet the necessary expenses. If an additional case occurs it will be necessary to procure a nurse. The physician will make no unnecessary visits within the lines, but will keep himself constantly informed by verbal communication with the nurse of the condition of the patient. After leaving the house he

will make a complete change in his clothing and take a disinfectant bath before visiting any other patient.

The circular of the Board on precautions against smallpox should be placed in every family by the sanitary committee. Until the quarantine committee have selected the guards you are authorized to assign the duty of watching the house to the town constable. The guards will wear the badge of the State Board of Health, and are authorized to arrest and return to the house any person or persons endeavoring to escape therefrom, and to use such force as may be necessary to accomplish this object. You will inform yourself of the distance of all neighboring towns and villages, and of the frequency of communication between them and Point Pleasant. You will immediately report to this office, upon your return, the number of persons sick, the probable number exposed, the number of inmates of the infected house, the population of the village, the names of railroads passing through or near it, and the number of persons vaccinated up to the present time.

(Signed) BENJAMIN LEE, Secretary.

SMALLPOX AT MORRISVILLE.

(2) Request was received from the Burgess of Morrisville, Bucks County, for the assistance of the Board in dealing with a case of smallpox in that borough, November 25, 1891. The inspection was at once made by Medical Inspector Atkinson. He found the house already placarded by order of the Burgess, a professional nurse engaged, a guard posted and vaccination being thoroughly performed. Instructions were sent to the Burgess as to the enforcement of precautions in detail, and also with regard to the steps to be taken should other cases occur. Fortunately this was not the case, as there was no further development of the disease. It may be stated that the individual who was the cause of so much annoyance and expense, although doing business in Trenton and aware of the prevalence of smallpox, had stubbornly refused to be vaccinated. It is unfortunate that there is no law inflicting heavy penalties on such criminal stupidity.

It was a pleasure to find a Burgess so thoroughly alive to the responsibility resting upon him and so intelligent in its discharge.

SMALLPOX AT CLARKE'S VALLEY.

On the 24th of March smallpox was reported at Clarke's Valley, Schuylkill County. Dr. Murray Weidman, Medical Inspector of the Schuylkill District, was at once instructed to investigate, and to enforce stringent precautions if the report was found correct. He verified the diagnosis of the attending physician, Dr. E. Phillips, of Tower City, and the patient and exposed persons were isolated at the cottage where the outbreak occurred. Five cases of confluent smallpox occurred in this family, three of which proved fatal. The disease was stamped out, and the cottage thoroughly cleansed and fumigated. The wise precaution was taken of killing a cat and a dog which had been exposed to the infection, as the contagion of this and other communicable diseases often clings to the hair or fur of animals, retaining its vitality for a long time.

SMALLPOX AT COUDERSPORT, POTTER COUNTY.

In the case of an outbreak of this disease at Coudersport, in consequence of the absence, illness, or urgent professional engagements of several

of the medical inspectors, considerable difficulty had been experienced by the Secretary in obtaining the services of an inspector. Ultimately, Dr. J. R. Thompson, medical inspector of the Allegheny District, was secured. He reported that owing to an opinion expressed by one of the resident physicians there had been doubt as to whether the cases were true smallpox or not. He found seven cases of discreet smallpox, confined to two families. One case proved fatal. The disease originated in a Polish family named Pallaskie, six of the cases having developed from the first fatal one. The patients were removed and isolated in a pest-house and every precaution as to disinfecting the houses, boiling and burying of clothing, taken. No further cases resulted.

The thanks of the Board are due to Dr. Thompson for thus going into a district, at a considerable distance from his own, at great personal inconvenience and to the detriment of his professional interests. The knowledge of the fact that a physician has exposed himself to any contagion, but especially that of variola, on the part of his patients, always creates a feeling of uneasiness, and may temporarily seriously interfere with his practice. The Secretary would suggest the propriety in such cases of assigning increased compensation to the medical inspectors.

SMALLPOX AT TITUSVILLE.

Smallpox occurred at Titusville, Crawford County, in the person of an immigrant child, who had arrived at the port of New York two weeks previously in the steamer "Diana." The presumption was very strong that the infection had been brought in the baggage. The Secretary, therefore, communicated with the Health Officer of the Port of New York, at which the vessel had entered, transmitting a resolution of the Board requesting increased care in the disinfection of the baggage and personal effects of all immigrants landing from steamers on which contagious diseases had existed during the voyage.

DIPHTHERIA.

Although, as already stated, diphtheria has been widely disseminated throughout the State, its most general and fatal prevalence has been in the cities of Erie and Philadelphia.

DIPHTHERIA AT ERIE.

On the 6th of January the Secretary received the following telegram from Dr. A. A. Woods, health officer of Erie, medical inspector of the Lake District: "Telegraph power to close schools here; diphtheria epidemic; come if I telegraph to-morrow; explanation in post." To this the Secretary replied: "Close such schools as you consider necessary to check epidemic of diphtheria." At the same time the Secretary wrote Dr. Woods, advising a conference between himself and the school directors, and that he should endeavor to persuade them, in view of the facts which he could lay before them, to themselves take this step.

On the 13th of January the following telegram was received from Dr. Woods: "Total cases reported since September, 195. Deaths: October, 10; November, 11; December, 25; January, 15; week ending December 19, 7; week ending December 26, 9; weeks ending January 2 and 12, 8 each. Eleven new cases reported January 10, 11 and 12, all in new houses. Have 22 houses placarded, containing 44 cases. I proposed to committee to close buildings having pupils sick; they refused. Papers condemn the school

board; majority of papers support me. Lawyer advises peremptory mandamus; court will grant."

As a result of Dr Woods' wise and energetic action and untiring devotion the epidemic began to decline rapidly, and public opinion was so thoroughly aroused that the attendance on schools from which cases appeared to originate almost entirely ceased. In a few weeks, however, the public began to relax their precautions and the epidemic was relighted. On receiving a second urgent request from Dr. Woods, the Secretary issued a peremptory order for the closure of both public and private schools. This was complied with and the epidemic at once began to abate.

Dr. Woods' management of this serious epidemic cannot be too highly commended. The department of public education being a distinct branch of the State government, having plenary powers of its own, it will readily be seen that the State Board of Health should endeavor, wherever it is possible, to exert its influence for the control of epidemics rather by acting as an advisory body to that department than by asserting its own authority, which it undoubtedly possesses. Inasmuch, however, as the exercise of such authority, in order to be of service to the community to save life should be prompt, and as the authority of the Secretary to issue such an order in the interval between meetings of the Board was, in this instance, called in question, and lives were thus sacrificed to a legal quibble, the Board instructed the Secretary to draw up a regulation which should prevent such factious opposition in the future. Such regulation is hereby respectfully submitted:

REGULATION VI.

"Whenever the Secretary shall have satisfactory information that any of the following diseases, viz., smallpox, varioloid, scarlet fever, diphtheria, yellow fever, typhus fever, or Asiatic cholera, is epidemic, or threatens to become epidemic, in any city, borough, district or place having no local board of health, or in which the sanitary laws or regulations are inoperative, he shall have authority, as executive officer of the Board, to issue a proclamation in the name of the Board declaring such disease epidemic, and to order and enforce such measures in the way of quarantine, isolation of the sick, vaccination, disinfection, and the closure of schools, public and private, religious and secular, as in his judgment may be necessary to stamp out the infection."

DIPHTHERIA IN PHILADELPHIA.

The Board of Health of this city and its indefatigable Health Officer, Major Moses Veale, finding that new cases of diphtheria were constantly occurring owing to intercourse between the occupants of infected houses and their neighbors, resolved to enforce domiciliary quarantine in its strictest sense. Every house in which the disease exists is strictly guarded, and neither ingress nor egress is allowed. The effect of this judicious measure is already noticeable.

REGULATION FORBIDDING THE TRANSPORTATION OF BODIES DEAD OF DIPHTHERIA.

In consideration of the increasing prevalence of diphtheria and the large mortality from it, the Board has considered it expedient to modify its regulation regarding the transportation of dead bodies in such a way as to forbid entirely the transportation of the bodies of those who have died from that disease. Notice of such modification has been sent to all local Boards of Health and to all railroad companies in Pennsylvania, and to the Boards of Health of other States. The leading railroad companies have issued circulars embodying this prohibition.

MEASURES TO PREVENT THE SPREAD OF TYPHUS FEVER.

The almost total disappearance of typhus fever (ship fever, famine fever) from our shores in the last fifteen or twenty years, speaks volumes for the efforts of sanitarians and philanthropists in improving the hygienic conditions of the steerage of our ocean steamers. Something must be allowed,

also, for the diminution of the period of detention on shipboard owing to the increased speed of vessels. The sudden outbreak of true typhus among a colony of Jews recently arrived in the city of New York from the famine-stricken districts of Russia, in the early part of the present year, was a genuine surprise. The health authorities of that city were, however, equal to the emergency, and soon had every case isolated, as well as those who had been exposed to the infection. Through the courtesy of the secretary of the State Board of Health of New York, the names and special destinations of every individual immigrant ticketed to a point in Pennsylvania who had been a passenger on the "Massilia," the vessel which brought the disease, were furnished to your Secretary. He in turn telegraphed this information to the authorities of the several towns, with instructions to keep the individuals under observation for a short period. Within a week he had received information that each one had been located. The fever appeared only in two places — Pittsburgh and Philadelphia — and was promptly checked.

MEASURES OF DEFENSE AGAINST THE INVASION OF ASIATIC CHOLERA.

At the meeting of the Board in July, 1890, your Secretary called attention to the gradual spread of cholera along the shores of the Mediterranean, and to the resultant duty on the part of all municipal authorities in the State to immediately put their cities and towns into such a condition of cleanliness that should the disease reach this country the germs would find no congenial soil in which to develop. He at the same time suggested the passage of a resolution calling upon the Board of Health of the city of Philadelphia to temporarily prohibit the importation of rags from Spanish ports. Although the disease disappeared almost entirely from Spain it steadily made its way westward overland from Asia, until, in the beginning of the present year, the situation began to be threatening.

On the twenty-first day of May, in anticipation of its early arrival in this country, Circular No. 7 (Revised), on "Precautions against Cholera and other Choleraic Diseases," was sent to more than three hundred prominent daily papers throughout the State. This was conceived to be the most effective mode of reaching both the health authorities and the people. On the seventh day of July the Secretary visited the quarantine station of Boston, and on the ninth that of New York, and conferred with the authorities of those stations as to the means to be adopted to place them in a greater state of efficiency. At the meeting of the Board on the eleventh day of July, he reported the prevalence of cholera at numerous points in Europe, and asked the sense of the Board as to the expediency of issuing a special circular, in addition to the regular circular just alluded to, calling upon the people throughout the State to take the necessary precautions against the introduction and spread of the disease. The Board did not immediately order the preparation of such a circular, but requested the Secretary to take such action whenever in his opinion it should become imperative.

Immediately on receiving intelligence of the prevalence of cholera in Hamburg, doubting the capacity of the station at the Lazaretto to care for any large number of suspects and patients, he wrote to Dr. William H. Ford, president of the Board of Health of Philadelphia, and Major Moses Veale, health officer, advising that all vessels from European ports be detained at the United States Marine Hospital Service Quarantine Station, Delaware Breakwater, for examination.

On the 26th of August he telegraphed Dr. Walter Wyman, supervising surgeon-general of the United States Marine Hospital Service, as follows:

"The State Board of Health of Pennsylvania considers that you would be justified in including arrivals from all European ports in your order of the 18th instant."

[TO BE CONTINUED.]

SANITARY APPLIANCES

AND

MEDICINAL PREPARATIONS

This department is designed for the description of improved Sanitary Appliances and Medicinal Preparations introduced by patrons of The Annals. The matter is not paid for, nor can it be classed as advertising. But as the information is necessarily obtained from those who offer the appliances for sale, it is proper to say that the manufacturers, rather than ourselves, are responsible for the statements made.

The Cremation of Garbage.

The unusual severity of the present winter has interfered sadly with the work of the Street Cleaning Departments of all our large cities. Heaps of muck, consisting of kitchen garbage, ashes, store and sidewalk sweepings mixed with mud and snow, have been piled in many cases two and three feet high the entire length of a street, and have remained practically undisturbed for weeks at a time.

In New York, Street Commissioner Brennan has had his entire department paralyzed by the fact that the garbage scows have remained for weeks frozen at the docks and filled to overflowing with the refuse of the metropolis. But while drifts of snow and ice-locked harbors have brought out quite strongly the need of other sanitary measures for the cleaning of our cities, a mild open winter ought to appeal to the authorities just as forcibly for the employment of measures calculated to destroy the noxious, pestilential off-scourings of our towns and cities. The increase in the number of zymotic diseases during the last decade, the multiplicity of bacteria spores, microbes, etc., bearing relation to certain endemic and epidemic diseases which have been discovered in this and other countries by scientific investigators, afford proof sufficient that such scourges as cholera, typhus fever, small pox, etc., are found to increase in direct ratio to the decaying heaps of garbage and polluted waters found in and near large centres of population. These facts interest not alone the officials of large cities. We learn that "after an exhaustive examination of all the known methods for the disposal of waste, the Columbian Exposition adopted the Engle System as the one which promised the best sanitary protection for the Exposition. *The Chicago Tribune* gives an interesting account of this particular establishment, from which we reproduce the following :

To the southwest of the World's Fair buildings a garbage crematory has been nearly completed, built under a contract with the Exposition Company for what is known technically as "an operating exhibit," and while other garbage crematories may be exhibited on the grounds, the Engle Crematory will be the only one in actual operation. West of the crematory will be the sewage-cleansing plant.

The crematory has been built to burn 100 tons of garbage daily. Every improvement yet made in the destruction of garbage will be shown. No sooty smoke and no unpleasant odor will come from the furnace. From out of the smoke stack a white, inoffensive smoke, almost invisible most of the time, will pass. That is all.

The success of the Engle crematory lies in having two fires in the same furnace. The gas and smoke from the first fire, where the original combustion takes place, pass

through a second fire in which the imperfect combustion is made complete. All the garbage on the Exposition grounds, which will be equal to that produced by a city of some 45,000 people, will go directly to the crematory. This will include the general refuse, from potato parings to a dead horse. The garbage is discharged from wagons on a slide, and descends toward four circular openings, and as covers of fire clay are drawn aside it falls into the furnace. Although no ashes will be produced on the Exposition grounds, and will not under ordinary circumstances come to the crematory, yet tests showing that the mixture of garbage and ashes does not ruin the utility of the crematory will be given frequently.

The sewage-cleansing plant, including the buildings, cost the Exposition \$55,000. The garbage crematory is being erected by the Engle Sanitary and Cremation Company of New York as an exhibit, and its cost is not known by the World's Fair management.

No city in the world will have a more perfect system for disposing of its refuse than the World's Fair will have in operation within a month or two. The thousand tons of organic matter hauled in upon the grounds every twenty-four hours will go back to its original elements.

Such an object lesson in a science so important can but result in a substantial advance in sanitation. The devices for disposing of garbage and sewage will be of especial interest to city officials visiting the Fair.—*The Chicago Tribune* of December 21, 1892.

When it is considered that the Engle Garbage Crematories were introduced to the public only about five years ago, the success that has crowned the efforts of this company is most gratifying to all friends of good enterprises.

Thirty-two of these crematories have been built, among them the following: Des Moines, Ia.; Butte City, Mont.; Findlay, Ohio; Birmingham, Ala.; Jacksonville, Tampa, St. Augustine, Fla.; Panama, Colombia; Concy Island, N. Y.; Brunswick, Ga.; Savannah, Ga.; Richmond, Va.; Norfolk, Va.; Salt Lake City, Utah; Ogden, Utah; Lowell, Mass.; Two Military Posts of the U. S. Government; New York City; The World's Columbian Exposition, Chicago.

It would be a great mistake, however, to suppose that these crematories, these furnaces for reducing garbage and polluting refuse to innocuous vapors and *valuable ashes*, are of use to great cities only. They are equally adapted to the use of school buildings, hotels and dwellings.

Correspondents desiring further information can address The Engle Sanitary and Cremation Company, 207 Fifth Street, Des Moines, Iowa, or 30 State Street, New York City.

Londonderry Lithia Spring Water.

The claim for this water is that "it contains more Lithium than any known water," the amount being 8.620 grains per imperial gallon; most useful in Gout, Rheumatism, Gravel, Acid Dyspepsia, Bright's and all Kidney troubles, and is of particular interest and use from the fact that it comes both sparkling and still. To have a carbonated table water, pleasing to the palate, useful in stimulating the appetite, and at the same time exerting a necessary healing upon the kidneys, is unique.

Some of the most eminent physicians in the United States have told us they will never use any other table water than Londonderry.

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THE
ANNALS OF HYGIENE
PHILADELPHIA
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COMMUNICATIONS.

Cholera.

BY THE EDITOR.



THE question uppermost in the mind of every thoughtful person at the present time is, "*Shall we have a visitation of cholera this summer?*"

DR. E. O. SHAKESPEARE ON THE
PROBABILITY.

We will answer this question in the words of Dr. S. T. Davis, of Lancaster, the president of the State Board of Health of Pennsylvania, who, in the course of his recent address before the legislature, said:

"This subject I will put in the form of a question. Will we have an epidemic of cholera in the United States, in this the year of our Lord one thousand eight hundred and ninety-three? I have not said that we would, because I do not positively know that we will or will not have an epidemic of cholera in 1893. But I do know that the only way to arrive at positive conclusions on any subject is to tabulate all of the facts from year to year, day to day, and hour to hour, and strike the average."

This rule holds good in all the affairs of men and nations and diseases. I also know that E. O. Shakespeare, M.D., ex-United States cholera commissioner, and ex-port physician of Philadelphia, is the highest authority on the subject of Asiatic cholera in the United States, or possibly in the world. Hear what he says in one of the Philadelphia papers under date of January 23, 1893:

“The necessity for prompt and effective precautions against cholera this year is dependent upon and proportionate to the reality and the greatness of the dangers to which this country will be exposed.

“We can discuss this question reasonably, and rightly estimate its importance only by recurrence to the past history of cholera in Europe and in the United States.

“It is an historical fact that this country has never suffered from cholera, or had to defend itself against an invasion of this plague except during years when it prevailed in some quarter of Europe. It is also indisputable that no epidemic of cholera has ever entirely vanished from Europe in less than four to twelve years, after having gained a foothold there. It is likewise undeniable that whenever in the past cholera has prevailed for two or more years throughout Russia and central and northern Europe, especially around the southern shores of the Baltic, the North Sea and the English Channel, North America has never escaped a visitation, which has been more or less disastrous.

“Our experience in the past should teach us to be even more apprehensive this year than we were during the last autumn, for, heretofore, it has always been the second or third year of prevalence of cholera in Europe that has brought with it the greatest danger to this country. Indeed, only twice has cholera ever reached even our quarantine stations during the first year of the epidemic in Europe, namely, in 1865 and 1892.

“The present persistence of cholera in Europe, in spite of cold weather there, is only a repetition of past experience, and that past experience constrains all well-informed sanitarians to feel that there is no satisfactory reason why we may not look for a great outbreak of the epidemic in many parts of that continent with the first advent of the warm season.”

To prove that he knew what he was writing about, I find the following in the *Philadelphia Press*, a few days ago:

CHOLERA'S ONSLAUGHT.

From St. Petersburg, Marseilles and Hamburg come notes of warning.

Special Cable Despatch to the Press.

London, Feb. 11.—As if at a given signal, in three widely different countries the onslaught of the cholera has begun. From

St. Petersburg comes the news, wholly unexpected, of course, than ten persons have died of cholera with the cessation of the frost.

From Marseilles the plague has all the added horror of newness, and the people are trying hard to cover up the dead and to quiet the fears of the living.

The news from Hamburg directly affects America. In the suburb of Altona a prisoner in jail has just died, and five other cases are being closely watched. The port of Hamburg itself has not been allowed to escape. On board the steamers "Echo" and "Australia" four sailors were stricken with the disease.

The weather is moderating all over the continent, and the sunshine is kissing back to life the cholera germs. Next week may show a wider spread of the plague. Meanwhile Vienna is sending invitations to all nations to an International Health Congress, to formulate some plan of fighting the common foe, and in England Southampton is begging Parliament to vote money to keep up a rigid quarantine.

Referring again to Dr. Shakespeare's letter, he says: "It is true that we now know much more than was known at the time of the previous visitation of Europe by cholera, during 1884 to 1887, of the most efficient means of combatting the spread of this disease, and we also know that many European health authorities are making sanitary improvements and organizing for the coming struggle. It might, therefore, be inferred that with this more exact knowledge and this early preparation the European governments may be able to much more surely prevent and control the spread of the local epidemics, which are pretty certain to develop next spring and summer.

"But the recent experience of Hamburg, which has just gone through the most terrible epidemic of cholera that has ever ravaged that city, and the present persistence of cholera in Holland, Belgium, France, Austria and Russia, should warn us how delusive that inference may prove, and at the same time incite us to provide promptly and unstintedly for a wise and vigorous course of defensive action."

RATTLESNAKES AND CHOLERA.

If the streets of the cities of our land were now full of dormant, hibernating rattlesnakes, there is no question but that we would take most active measures against the self-evident danger

that would attend the inevitable revivification of these reptiles with the advent of warm weather. Seeing the danger we would realize the danger; but though our country may, even at the present moment, be the habitat of billions and billions of cholera germs, their very invisibility makes us heedless of their mighty power until the fatal effects of their presence becomes woefully and painfully evident. No one can say with certainty that there are not now many localities in this country wherein dormant cholera germs, introduced during the past winter, are but waiting the advent of warm, moist weather to spring into activity, radiating in every direction from these centres of infection to devastate our

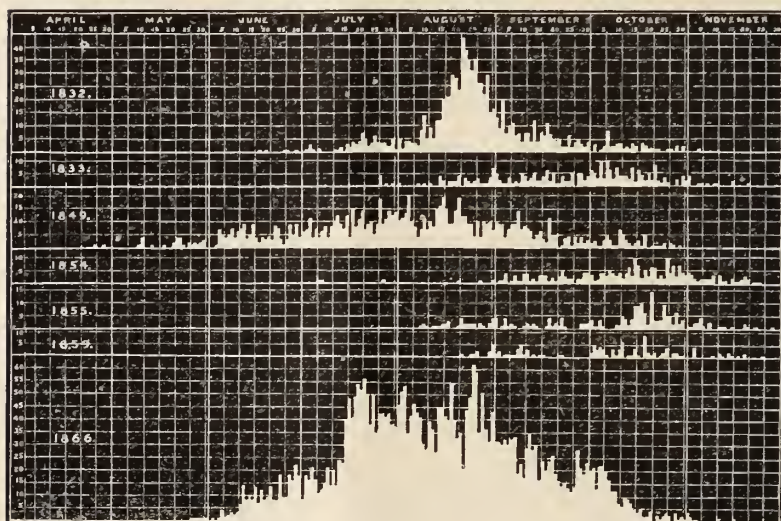


DIAGRAM OF SEVEN CHOLERA EPIDEMICS AT BRUSSELS.

1832:	deaths =	to	87	per	10,000,
1833:	"	=	27	"	10,000,
1849:	"	=	73	"	10,000,
1854:	"	=	19	"	10,000,
1855:	"	=	16	"	10,000,
1859:	"	=	7	"	10,000,
1866:	"	=	212	"	10,000.

land, from the Atlantic to the Pacific, and from the Canadian border to the Gulf of Mexico. Clearly understand us; we do not assert that dormant germs are now with us, but we do claim that no one has the right to assume that they are not, while the inference that they are has much reason to support it. The fact exists

that occasional cases of cholera have occurred throughout the past winter at different points in Europe and Asia, as the following list will testify:

CHOLERA IN CITIES AND TOWNS IN EUROPE AND ASIA DURING
THE WINTER OF 1892 AND 1893.

Frankfort-on-the-main, Germany, October, 1892.

Buda-Pest, Austria, October, 1892.

Altona, Germany, October, 1892.

Erzroom, Asia Minor, December, 1892.

Trebizond, " " "

Belgrade, Servia, December, 1892.

Galicia, Austria, " "

Astrakhan, Russia, " "

Hamburg, Germany, " "

Persia, Asia, " "

Yemen, Arabia, " "

Buda-Pest, Austria, " "

Hamburg, Germany, eleven cases, December, 1892.

Nantes, France, January 6 to 16, nineteen cases and eleven deaths.

Hamburg, Germany, January 1 to 19, thirty-four cases and seven deaths.

Nietleben Asylum, Germany, sudden outbreak of cholera, January 14, 1893. The first case occurred January 14, and ended fatally the following day. Numerous cases and deaths among patients and attendants followed. By January 22 the cases numbered eighty-four, deaths thirty. Among the former were two physicians and one female attendant. The origin of the epidemic is not explained, but three months ago an attendant from Hamburg was taken into the establishment. The water of the Saale below Nietleben has been pronounced suspicious.

Cases also occurred in France during January, at Nantes, Dunkirk, St. Pol Lorient, and other places. Also in Holland, at Amsterdam, and at the Hague.

At Marseilles, France, in the latter end of February.

These statistics furnish ample evidence for the belief that cholera germs are now very thickly strewn throughout Europe, and that there is very little question but that when the countless myriads of organisms that constitute the army of cholera feel the reproductive and invigorating influence of warm weather they

will make a vigorous and (if we are not very much alive to the situation) a successful attempt to ravage our own country, aided, possibly, by the advance guard which they may have sent in during the past winter. There is, after all, not such a great difference between an invasion of epidemic disease and an invasion of armed men. They are both bent on destruction, and they should both, if possible, be kept out; but should the armed men be strong enough to get in, they are always strong enough to destroy; on the contrary, however, should the germs of disease secure an entry, even then they may be robbed of much of their virulence, if they do not find conditions favorable for their work. It is a fact, and a fact of the utmost importance, that on its march of destruction cholera has been known to absolutely avoid localities that are sanitarily clean. Cholera, like an avenging angel, seems to select those localities for its retributive work wherein neglect of Nature's law has brought, deservedly and inevitably, upon the people the vengeance of Nature's God. As Sodom was destroyed, the innocent with the guilty, because the latter were so greatly in the majority, so it may be assumed that a cholera-stricken city is a city that has sinned grievously from a sanitary point of view.

There can be no question of one fact which amply illustrates the beneficence of a second. There can be no doubt that the world of to-day does not witness such frightful epidemics as those of by-gone days, and there can be no doubt that this fact is due to the second fact that people do live, and daily still more and more do live, in accord with the way in which Nature intends that they shall live. The foregoing diagram of seven cholera epidemics at Brussels, which boasts of being one of the best administered towns on the continent of Europe, so far as sanitation is concerned, well illustrates this point, as it also clearly shows that cholera is essentially a warm-weather disease.

It is true that, in 1866, the mortality was greatly in excess of that of any previous epidemic, but if we omit this exceptional year we note a decrease in mortality from 87 per 10,000 in 1832 to only 7 per 10,000 in 1859.

THE GREAT PLAGUE IN LONDON.

Again, let us glance at the great plague which ravaged London in 1665, when the dead augmented beyond the means of enumeration, the churchyards were no longer capable of receiv-

ing the bodies, and large open spaces on the outskirts of the metropolis were appropriated for the purpose. Whole families, and, indeed, whole streets of families, were swept away together, insomuch that it was frequent for neighbors to call to the bellman to go to such and such house, and fetch out the people, for that they were all dead. The grave was now a "yawning abyss," deeper and more extensive pits were dug, and the rich and the poor, the young and the aged, the adult and the child, were all promiscuously thrown headlong into one common receptacle.

The dead carts made their rounds nightly, and when, in the opinion of the "buriers," a sufficient load was heaped up, such load was drawn to the most convenient or nearest pit and there



BURYING THE VICTIMS OF THE PLAGUE
IN LONDON IN 1665.

thrown in as hastily as possible, sometimes immediately from the cart and sometimes by means of long hooks, made like a shepherd's crook, with which the bodies were dragged out. This plague swept away 160,000 persons. Surely, such frightful plagues are, we earnestly hope and trust, things of the past.

From the old print on page 203 we see with what horror the plague was regarded at Constantinople. When it is announced that the patient has the "plague," note with what haste she is deserted even by the members of the family, and from the description of this plague we quote as follows: "The man who is apprehensive of contagion is always the first to take the disease; fear is the predisposing cause of plague; bad living and bodily debility

are the proximate causes of the susceptibility of pestilence." That which was written of the plague is eminently true of cholera. Should the disease gain a foothold fears thereof will greatly promote individual susceptibility. Correct methods of life and cleanliness of surroundings, combined with absence of fear, will offer the best personal safeguards. To go back more directly to the subject in hand and to discuss, for a moment,

THE BACTERIOLOGY OF CHOLERA AND METHODS OF DISINFECTION,

Dr. George M. Sternberg, the deputy surgeon-general of the United States army, and an exceptionally high authority, tells us, in the *Brooklyn Medical Journal*, that the germ of cholera is very easily destroyed; indeed, it is one of the most easily destroyed of all the known disease germs. It would seem that this germ will flourish best in only moderately foul water, because in sewage or liquid that is rich in common organisms the weaker life of the cholera germ is crowded out by the others. It grows readily on moist linen, or the soiled clothing of patients. An exposure of ten minutes to a temperature of 140° F. may be relied upon for the destruction of this germ. These germs are also very easily destroyed by desiccation, a few hours' exposure to dry air usually sufficing to destroy them.

Now, therefore, in regard to articles coming from abroad that have been ten days or more on the steamer—merchandise, mails, etc.—I can hardly understand how clean merchandise in original packages or mails could become infected. The mails might easily become infected by scarlet fever or smallpox from convalescents. We know very well that something from the surface of the body of such persons might get into letters written by them, and be transmitted in that way, and yet we very rarely hear of that sort of thing happening. We do not attempt to fumigate our mails on account of smallpox, and in the case of cholera, where the germ is in the intestine, even if a sick person sat up and wrote a letter, the chances are that the letter would not convey any infection. I therefore think that all this insistence upon disinfecting the mails and merchandise is going a little too far in that direction, especially as we know the biological characters of this particular micro-organism, and know that it is quickly killed by desiccation.

As for disinfection, the experiments made by Bolton, under my direction, show that these germs are killed in two hours by

mercuric chloride, 1:10,000; sulphate of copper, 1:500, and carbolic acid, 1:200. The Committee on Disinfection of the International Conference held in Rome in 1885, recommends as a means of disinfection against cholera, besides destruction, steam at 100°C ., carbolic acid, chloride of lime, and aëration. Carbolic acid and chloride of lime were to be used in aqueous solution as follows: Carbolic acid, 2 per cent.; chloride of lime, 1 per cent. (called the weak solutions); carbolic acid, 5 per cent.; chloride of lime, 4 per cent. (called the strong solutions). These means of disinfection were to be applied as follows: For the disinfection of persons, one of the weak solutions should be applied. For the disinfection of



THE PLAGUE AT CONSTANTINOPLE.

clothing, bedding and similar articles, the direction is given that steam should be passed through the articles for one hour.

Steam and dry heat, as you know, are two very different matters. There has been a great deal of bad practice on this subject. Certain persons, having read that 60°C . kills the spirillum, have taken it for granted that if an oven is heated up to somewhere about 60°C ., the cholera spirillum will certainly be destroyed. But Koch's experiments, made upon other similar organisms having about the same resisting power, show that if dry heat is used the temperature must be carried up to 220° or 230°F . Learning that 220° to 230°F . is required, and ignorant of the fact that it was dry heat that was meant, some authorities have directed that

steam should be used at that temperature, which gives you a very great pressure and makes it impracticable. As a matter of fact, 100° C., the boiling point of water and temperature of live steam, is all that is required. It must, however, be freely admitted to the chamber in which the articles to be disinfected are placed, and must come in contact with them. If I were in charge of a quarantine establishment, and were disinfecting a quantity of things, and was satisfied that live steam had been in contact with every article thoroughly for five minutes, I would be satisfied that the disinfection was complete—a great deal more so than if a lot of articles were tumbled in together, and left for an hour exposed to the action of steam, for in this case some of the articles might not be disinfected at all, as the steam does not penetrate readily into the interior of such a mass. This is an important point in using steam or sulphur dioxide. The International Sanitary Conference directs: "Immersion for twenty-four hours in one of the weak solutions—carbolic acid, 2 per cent ; chloride of lime, 1 per cent."

CHOLERA AND FILTH.

That there is an intimate relationship between what we might call local filth and local cholera seems to be well established; that is to say, it would seem that in a given city the disease will be found in dirty houses, while it will avoid those that are clean. We do not mean to generate a false sense of security in the absolute protective power of cleanliness by this statement, because even though one's habitation may be very clean, yet the disease may be contracted from contaminated water or food, but, other conditions being equal, domiciliary uncleanness will favor the occurrence of the disease.

In this drawing, from *The Lancet*, we see the pipe that is intended to carry the slop water from the upper stories of the house discharging its contents into the yard, whence it slowly gravitates along a little gutter till it reaches the street gutter, and thence goes to the nearest sewer. It will be noticed that the gutter in the yard is blocked up by stones and rubbish, which checks the flow of slops and makes them spread over the entire surface of the passage. The gutter itself is made of loose bricks, without any cement, so that the ground beneath the house is saturated with slops.

Writing of the Impasse des Corderies (p. 206), in Havre,

where cases of cholera occurred, the correspondent of *The Lancet* thus writes:

“This is a small street through which there is no thoroughfare, and which consists almost exclusively of wooden huts. Some of these huts have but one room and one floor, the ground floor, and several are inhabited by washerwomen. This accounts for the number of large tubs outside the huts. The rooms are very low, and the door in some cases only four to five feet high, so that it



NO. 21, QUAI COLBERT, AT HAVRE, BACK YARD.

is necessary to stoop to enter. In one of these little wooden houses was found an old woman busily engaged in washing, not her own linen, but that of other persons. Across the dark, low room linen was hung up to dry. The wooden walls were black with cakes of greasy, adhesive dirt. In a sort of closet cupboard, partitioned off from the room by badly-fitting planks, were lumber, coal, rags, etc., and a wooden tub. The tub served as the

closet of the house, and its fæcal contents spread foul odors throughout the hut. There were slops on all sides—on the black, dirty floor of the dwelling, stagnating on the bare earth outside the door, or slowly traveling along the central gutter of the alley, which constitutes the main and only drain of the place. On the opposite side the *tinettes* or pails were placed under the staircases leading to the little upper rooms in the roofs. Most of the inhabitants of this wretched quarter were dressed in mere rags. There were a great many poles to hang up linen or fishing nets to dry, and yet there is no provision made to drain away the dirty water from the washing tubs and the domestic slop-pails."

Now, is it any wonder that cholera occurred under such circumstances? is it not rather a marvel how human existence is maintained at all with such surroundings?

Listen to the *Lancet* correspondent's description of another cholera nest at Havre. "No. 17 Rue des Galions (p. 209) was one of the cholera-stricken houses of Havre. The Rue des Galions is one of the narrow streets in the Quartier Notre Dame, running down to the Grand Quai of the Avant Port, or tidal basin. Entering a passage I found a badly-kept urinal. A door on the left-hand side served a double purpose: it was at once a closet door and a street door. The closet consisted of a large tub placed in a dark corner; there was no seat. By pulling the street door open this shut off the corner and insured a certain privacy. When the street door was shut there was nothing to check the smells from the tub ascending into the building. In the wall, near the tub, a little hole had been made so that any liquid filth on the floor might flow out into the passage leading from the back of the premises to the street. Immediately opposite, on the other side of the passage, two more tubs were placed facing each other, under a staircase. There was not room to stand up under the staircase, and the corner was absolutely dark. A rough wooden seat was fitted over the tubs, but they were not closed, and gave forth horrible odors, which passed up into the house through the chinks in the stairs that covered them. The passage in which these pail-closets were situated led from the street to an inner yard surrounded by dwellings four stories high. In this roughly-paved yard there were several costermongers' carts, and two more pail-closets standing side by side, near the entrance to the houses at the back of the yard and just under a bedroom window. This will be noted in the sketch, and it will also be observed that the

inhabitants of the room in question, not content with the effluvia from these pail closets, keep a stock of parrots and other animals. The staircase being in the corner of the yard serves for the buildings on both sides of the angle. In this corner there is on each floor a large inner room; and on the first floor this inner room, being surrounded by other houses, has no window, no light whatever. Yet this room, into which daylight has never penetrated,



THE IMPASSE DES CORDERIES, IN THE PERREY
DISTRICT OF HAVRE.

has been selected to serve as a common lodging-house dormitory. There are seven beds in the room let out at the very high charge of fifty centimes per night to promiscuous lodgers. On the second floor the corresponding room, in consequence of irregularity in the shape of the surrounding buildings, has a window, but it measures only one foot square. On the third floor the room has several small windows. Surely it would be possible to prevent

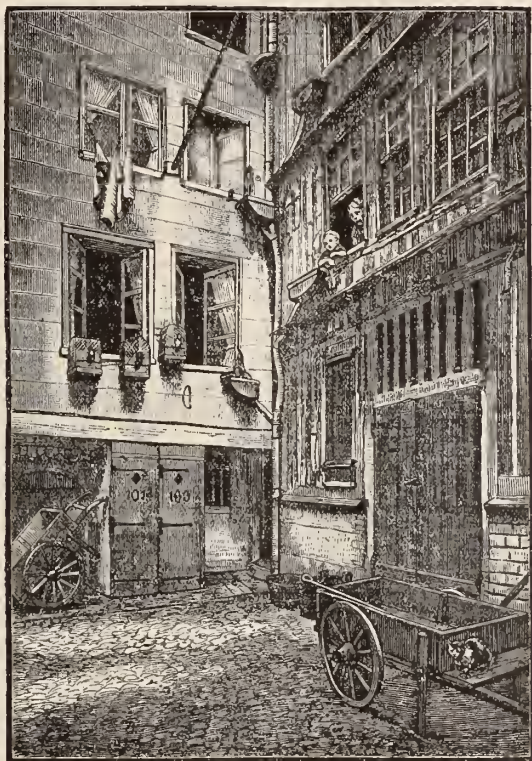
persons sleeping in rooms that have no windows and where daylight can never enter. It will be seen also that there is room to construct more closets in the yard, so that the abominations under the stairs in the passage from the yard to the street might be abolished; but, apart from the abomination of these badly-placed and badly-kept pail-closets, the disposal of slop water constitutes an organic defect which exists throughout Normandy, and this is well shown by the photograph. A receptacle called a *plomb* will be noted by the side of several windows; it is a sort of sink. Into this are thrown all the slops, here are cleansed the chamber utensils, and here are often left the dirty brushes and clothes, etc., used for such purposes. There is no flush or method of cleaning these sinks, and needless to say that as the closets below are some distance away and are extremely filthy, it often happens that human dejecta are emptied into the sinks. The sink and the pipe beyond are greasy, filth adheres to the sides, and they give forth unceasingly the worst odors. Yet these foul-smelling mouths are just at the windows of dwelling rooms; when the window is opened the inhabitants breathe air tainted by these sinks. Then the pipes and the sinks corrode, get out of shape, leak, and render the walls damp and foul."

Horrible, revolting, disgusting, nauseating, almost improbable as this description seems, we know of our own knowledge, because we have seen with our own eyes, that equally unsanitary localities are very prevalent in this country, and if the germs of cholera ever gain access to such soil, then look out for a crop of disaster and a harvest of death that will terrify the stoutest heart.

"What can be more abominable (again quoting from the *Lancet*), but, it must be confessed, more picturesque, than the mediæval Rue des Rosiers (p. 211) at Rouen? Here the houses are several hundred years old and built in a great measure of wood, and stand on redeemed marsh land. The street is very narrow, the houses very high and a central gutter constitutes the main drainage system. At the top of each house, right up in the gable, is a pail. What is not put in this pail—and the pail is not often emptied—goes to the gutter in the centre of the street or sinks into the earth before reaching the gutter. Here and in the Rue du Mouton, which is a continuation of the same street, there have been, in proportion, the greatest number of cases of cholera."

As we look at the Rue des Rosiers we can readily believe that the soil of the street never feels the influence of the sun, and

when we remember how potent is the influence of the sun in the destruction of disease germs, we are ready to recognize in this locality a favorite cholera soil. The quotations from the *Lancet* are unspeakably valuable, because they give us a clear idea of the localities favorable for cholera, and they warn us in unmistakable language that if we tolerate such spots we are cordially inviting the disease.



THE BACK YARD OF NO. 17 RUE DES GALIONS,
AT HAVRE.

THE HOME OF CHOLERA.

Dr. William V. Keating, of this city, makes to us the inestimably valuable suggestion that we should agitate the establishment of an International Sanitary Commission for the purpose of destroying the seed of cholera in its home; and where is this home? In far-off, dirty India.

THE HOLY WELL AT MECCA.

While for years the "Holy Well at Mecca" (p. 213) was the point of departure for cholera, this present epidemic seems to have started from "Meshed," the most sacred Moslem city in the world after Mecca itself. There is a stream of water flowing through the centre of the city, which serves as the common open sewer of the city and as the bathing place for all the faithful who wish to visit the shrine. It also supplies the population with water for drinking and all other purposes. Hence it is easy to see how cholera has made the place its home. Not only are the conditions there most favorable to the propagation of the plague, but the funeral customs that prevail throughout Persia seem to have the same end in view. A dying man, be his disease cholera or anything else, lies on a mattress on the floor surrounded by a dozen or a score of relatives and friends. The doctors ply their remedies, but in vain. A wild dervish applies charms and amulets, but in vain. The wife sits by the pillow, veiled and weeping, holding to her husband's nostrils a bit of mud or plaster torn from the wall and wetted with some aromatic liquid. The doors and windows are shut tight. A dozen pipes fill the air with tobacco smoke, and from a huge urn cups of steaming tea are drawn and passed about. As a last resort they kill a fowl and place it, warm and bleeding, at the dying man's feet. But even this proves unavailing, and he presently breathes his last.

The widow leaves the bedside and a priest takes her place. He fills the mouth, ears and nostrils of the corpse with moistened cotton wool, composes the limbs and places a cup of water by the pillow. Then he reads aloud some passages from the Koran, while all the others testify that the man was a good and true follower of the prophet. Another priest goes upon the roof, and at the top of his voice recites other passages from the Koran, thus announcing to the neighbors and to all passers-by that the man is dead. Soon the house is filled with lamenting friends and kindred, above whose tumult rises high and clear the shrill yelling of the professional mourners. The women relatives put on mourning costumes, and the men take knives and rip open some of the seams of their own garments, to give them the appearance of having been rent asunder in paroxysms of grief. They also daub their hats with mud, in lieu of throwing dust upon their heads. Finally, the "washers of the dead" come. They are despised outcasts, who gain a livelihood by the performance of

this work. They wash the corpse, wrap it in a shroud, place camphor about it and put it in a frail wooden coffin.



THE RUE DES ROSIERS AT ROUEN.

The burial always occurs within twenty-four hours of the death. The coffin is placed upon a bier, and the relatives contend

with each other for the honor of bearing it to the grave. This is esteemed a great privilege in all Mohammedan countries. The graveyard is a bare spot outside the town, the home of the jackal and the hyena. There are no waving cypresses, as in Turkey. A few small shrines mark where some holy men have been interred. Grotesque stone lions of life-size mark the graves of those who were warriors; while little square niches a yard high contain highly-colored pictures of unwedded youths, or of those slain in war. As a rule, however, small flat stones record the names of the dead, a few texts from the Koran marking the piety of their relations; but often the little mounds have merely a row of flints that loving hands have placed there, or a rough bit of rock or a tile at head and foot. The nearest relatives lay the body in the shallow grave, a priest says a prayer, the shroud is loosened that the dead man may be enabled to arise at the resurrection without trouble, and the coffin lid is replaced. Then another prayer is read. The "Fatihat," or first chapter of the Koran, is recited by all—it is merely a short prayer—the grave is closed, a little water is sprinkled on it, and all is over. If the family of the deceased can afford it, a tiny tent is pitched and a priest remains to pray and to read the Koran over the grave for many years.

Often among the rich or religious the body is merely placed in some mosque or shrine as amanat—that is to say, on deposit. After some months, or weeks, or years, it is wrapped in thin felt and dispatched with hundreds of others, by mule caravan, to Meshed, to be buried near Imam Reza, or to Kerbela, to lie beside the blessed Hossein. In traveling in Persia one frequently meets these caravans. Two, or even four, coffins are strapped on each mule. They stop at caravansaries over night, and in all respects are treated as though they carried only common merchandise. But as transmitters of contagious diseases, such as the cholera, they are most potent instruments.

SOME POINTS FROM HAMBURG.

It is a very instructive fact that Hamburg, with local conditions favorable for the disease, should have suffered as she did, while neighboring localities, in better sanitary condition, should have escaped. And it is also noteworthy and instructive that certain spots in Hamburg should have been especially liable to the disease.

We see on page 218 a particular building inhabited by 128

persons. Of this number 24 had cholera, and 13 died. The building was cleaned and disinfected by the city, and the disease abated. The moral is obvious.

The violence with which cholera raged in Hamburg last summer can be better imagined when we look upon the picture



THE HOLY WELL, AT MECCA.—THE HOME OF CHOLERA.

of a field hospital for cholera patients in which there were 500 beds. (See page 223).

As we gaze upon these realistic views of the cholera hospital let us read of the sufferings of the poor victim in the ambulance, as described by an American doctor who was in Hamburg during the epidemic.

"I saw a man, aged 28, with yellow hair and blue eyes, on a sofa, his face buried in a pillow, groaning with pains in the abdomen. He was attacked an hour and a half previously with violent purging and vomiting, accompanied by sharp cramps in the calves of both legs. During the previous twenty-four hours he had had diarrhœa without any accompanying pain. He vomited profusely a few minutes after my arrival. The fluid thrown up resembled clear water, with a sediment like bran. After vomiting the pains in the abdomen increased, the poor fellow threw his head back and groaned. Suddenly from his pallid lips issued the so-called choleraic shriek that may strike terror to the unfamiliar listener. After a period of repose the cries were repeated.

"The pulse was feeble, and the pallid face bore an anxious expression painful to contemplate; he gazed on me with pathetic, yearning eyes. The skin felt cold; even the breath was chilly. The voice sank into a husky whisper. His thirst was intense, and he begged piteously for water. He drank the contents of a quart bottle of kaiser water and speedily threw it off. The stomach of the patient was naturally delicate, and the disease took a strong hold.

"At 2 o'clock the sufferer's voice was raised so as to utter a cry. Subsequently there was no sound louder than the strident whisper characteristic of the disease. In feeble tones he frequently asked for water, and then would implore the doctor to save him from his agony. The amount of whitish fluid ejected from the stomach and bowels seemed prodigious. The kidneys ceased to act an hour after commencement of the attack. The condition known as collapse set in thoroughly at 2.30 o'clock. The skin of the chest and legs became of a grayish-blue hue, which was subsequently intensified. The hands appeared shriveled as if they had been soaked a long time in water. So far as the doctors' services were concerned they were of no apparent avail.

"The favorite position of the sick man was to lie on his side or his back with his knees drawn up as closely as possible to his chin. The collapse progressed rapidly, and at 5 o'clock the vomiting was limited to a small amount of dark fluid. The watery contents of his blood had poured out through the coats of his bowels and veins throughout the body, which was nearly empty at this time.

“Profuse perspiration bathed the skin of the patient; the perspiration clammy and tenacious. Large dark circles surrounded the eyes, which were sunken deeply into their large hollow sockets. The nostrils were distended, the lips partially open, disclosing white teeth in a ghastly grin. The red flush on



THE RESIDENTS OF THAT PORTION OF THE WORLD IN WHICH CHOLERA IS INDIGENOUS.

the cheek-bones that was frequent among the Eppendorff patients was scarcely recognizable at any time. At 6 o'clock the man was completely prostrated.

“During the next few hours the vomiting and purging ceased, and there were signs of delirium and muttered requests for a

drink. The horrible appearance of the man's countenance increased. His grin was deathly. No pupil of the eyes, only the whites, were to be seen. I watched for a change of symptoms, but none appeared, except that he seemed to grow weaker and weaker. He moved a little at times, but his prostration increased, and at 8 o'clock he was entirely oblivious to earthly suffering. His breathing became slower and slower; his hands, his feet and the surface of his body were icy cold. Breathing was apparent in a labored effort of the chest only five times in one minute.

"At 10.50, after a feeble respiratory effort of the chest, the sufferer remained still forever. The case was of exactly twenty-three hours' duration, and a more typical instance of the Asiatic plague has not been seen in Hamburg during the epidemic."

FOUL WATER.

We are now well familiar with the fact that polluted water is the most common means of conveyance of cholera, and it will be well if we take this knowledge seriously to heart rather before than after the occurrence of the disease, as was done in Hamburg. After the disease had gained a foothold, when the authorities and the people were terror-stricken, we find them boring wells and boiling water, and doing all that which if done earlier would have averted the epidemic.

We might go on indefinitely writing of cholera; we might cite the views of a hundred different authorities and find many points in which each would differ from all the others, but there is one grand, fundamental, unquestioned and unquestionable point upon which all unite, and about which there is no diversity of opinion, and that is the efficacy of CLEANLINESS.

Let your house cleaning be thorough, and let it be continuous throughout the spring and summer. "If each before his own door swept, the village would be clean;" so runs the old saying, and if that which it implies is carried out by all we need have but little fear of cholera. Let each one see that his house and surroundings are clean, and let him also make it his business to see that his neighbor does the same, and with such universal cleanliness, cholera, should it reach our shores, will find such a chilling welcome that it will inevitably languish and die a speedy death.

The Necessity for Precaution Against Cholera.¹

BY S. T. DAVIS, M.D.,

Of Lancaster, Pa.,

President of the State Board of Health of Pennsylvania.



THE necessity for prompt and effective precautions against cholera this year I regard as exceptionally great.

The facts stated by Dr. Shakespeare are well known to all sanitarians, and reflect not only his conclusions from a perfect knowledge of the whole subject, obtained not only from statistics, but years of study and scientific investigation in the midst of cholera epidemics, in both India and Europe, while an officer appointed for that special service by our government. Besides which, they accord with the opinions of all recognized sanitarians throughout the country. Suppose, for example, gentlemen, that all Europe had been preparing for war for two years; that hundreds and thousands of spies and foreign emissaries, disguised as immigrants, with a subtle poison concealed in their clothing, baggage, and even their currency, if they happened to have any, had been knocking at the gates of our ports of entry during the autumn months of last year; that, owing to the fact that our portals were well guarded, but few succeeded in getting through without being dispossessed of their missiles of destruction, with which they would have poisoned the air we breathe, the water we drink and the food we eat; that, owing to herculean efforts of both State and National authorities, and the early beginning of a severe winter, the enemy was repulsed, and apparent security was felt on our side of the Atlantic, our outposts were called in nearer shore, and instead of constant vigilance, a long and unsatisfactory council of war was being held. In the meantime an examination of the Custom House reports show that thousands of packages of all kinds of goods, and machinery of every conceivable description, have been sent through our lines and to the heart of our country, and many of them from the headquarters of the enemy's army.

Only last week the intelligence was flashed over the wires that, though the enemy became dormant during the winter,

¹ Abstract of an address delivered before the Legislature of Pennsylvania.

the first warm sunshine aroused them to action, and that the black flag was again unfurled, and they were a thousand-fold stronger than last fall, when they went into winter quarters.

Suppose these belligerent hosts were armed with modern engines of war, instead of disease germs, with thousands of them well equipped, with their faces turned toward our North American shores, what part would Pennsylvania take? You have, with



KASTAMIENALLE 37, HAMBURG.

one accord, answered the question. The spirit of 1876 would take possession of every man, woman and child throughout the length and breadth of our great State, and two hundred thousand Pennsylvanians would be marching to the sound of the fife and drum in defense of her homes and firesides; and this same appropriations committee would be ready and willing to recommend a million for defense, knowing that their constituents would approve

of their action, and commend them for their promptness in coming to the rescue. Briefly as possible I have given you the facts in relation to the probabilities and dangers of an epidemic of cholera in the United States during the coming summer, and if such should be the case you can readily judge as to whether Pennsylvania will be affected by it or not. Shall we wait until the enemy is upon us? Shall we wait until it appears at the quarantine station, again striving to force its way through the lines; or shall we now, while there is yet a little time, prepare for the fray? On strict business principles, what should be done? The people, through the legislature, constituted a board of health, whose duties are specific, and the principle of which is protection against the ravages of epidemic and pestilential disease; abatement of nuisances, sanitary investigations respecting the causes of disease, and especially of epidemic diseases, including those of domestic animals; sources of mortality and the effects of localities, employments, conditions, habits, food, beverages and medicine, on the health of the people, as well as the sanitary inspections of public institutions or places; also registration of births, marriages and deaths, and hundreds more of implied duties coming within the scope of the board, not enumerated in the Act of 1885 and subsequent supplements thereto. The board of health well knows what will be expected of it if cholera makes its appearance this spring.

What will be done in case of an epidemic of cholera? "Quarantine" and "cleanliness" are the two words which express the very best method of preventing the spread of contagious diseases. Quarantine corrals the diseased and removes them to safe distances from the well, while cleanliness disinfects them all and all their belongings. These facts have been so well and often established that sanitarians throughout the world are of but one mind on this subject.

One marked instance of quarantine and cleanliness. In 1854 the fearful death rate resulting from the filthy condition of the English army, in the Crimean war, startled the whole civilized world, and stirred up England to the necessity of cleanliness. This was effected largely through the instrumentality of Florence Nightingale, and reduced the mortality in the hospitals of the Crimea from 60 per cent. to a little above 2 per cent.

But to the question, what will be done in case of an epidemic of cholera? Every State will at once establish a quarantine against

its neighbor, and every avenue of travel by inland river, lake, and seacoast will be guarded by special inspectors, and no one will be permitted to pass either to or from one State to another without a certificate of health, and proper disinfection of baggage and persons. That you may have some idea of the magnitude of the work



A VIEW IN "THE SLUMS" OF HAMBURG.

to be done, in order to establish such protection in case of an epidemic, I name the following points necessary to be guarded, in order to quarantine the State of Pennsylvania.

STATIONS IN CASE OF EPIDEMIC.

Should cholera become epidemic in this country and threaten this State, stations will have to be established at the following points:

From the east: Phillipsburg, N. J., and Easton, on the Lehigh Valley and New Jersey Central; Trenton, N. J., and Morrisville, Pa., on the Pennsylvania; Trenton Junction, N. J., and Yardleyville, Pa., on the Philadelphia & Reading; Danfield, N. J., and Experiment Mills, Pa., on the New York, Susquehanna & Western; Delaware, N. J., and Portland, Pa., on the Lehigh & Hudson; Port Jervis, N. J., Rosas, Pa., Warrenburg, N. J., and Lost Hope, Pa., on the New York, Lake Erie, & Western; Hancock, N. Y., and Preston, Pa., on the Ontario, Carbondale & Scranton.

From the West: East Palestine, O., and Enon Valley Station, Pa., on the Pittsburg, Fort Wayne & Chicago; Liverpool, O., and Smith's Ferry, Pa., on the Cleveland & Pittsburg; Wheeling W. Va., Colliers, O., and Pans Road, Pa., on the Pittsburg, Cincinnati & St. Louis; Valley Grove, O., and West Alexander, Pa., on the Wheeling Division of the Baltimore & Ohio; Williamsfield, O., and Turnersville, Pa., on the Lake Shore & Michigan; Stinthers, O., and Reeves, Pa., on the Pittsburg & Western; Conneaut, O., on the Lake Shore & Michigan Southern; Girard, Pa., on the New York, Chicago & St. Louis.

ON THE NORTH STATE LINE.

From the north: State Line Station, N. Y., Susquehanna, Pa., Jamestown, N. Y., Corry, Pa., on the New York, Lake Erie and Western; Sayre, Pa., and Waverly, N. Y., on the Lehigh Valley; Elmira, N. Y., and Fassett, Pa., on the Northern Central; Corning, N. Y., and Lawrenceville, Pa., on the Corning, Cowanesca & Antrim; Addison, N. Y., and Osceola, Pa., on the Addison and Pennsylvania; Olean, N. Y., and Eldred, Pa., on the Western, New York & Pennsylvania; Carrollton, N. Y., and Bradford, Pa., on the Buffalo, Rochester & Pittsburg; Ripley, N. Y., and Northeast, Pa., on the Lake Shore & Michigan Southern.

From the south: Bald Friar, Md., and State Line, Pa., on the Pennsylvania; Sylmar, Md., and Nottingham, Pa., on the Philadelphia & Baltimore Central; Claymont, Del., and Chester, Pa., on the Baltimore and Ohio, and Philadelphia, Wilmington and Baltimore; Newark, Del., and Landeberg, Pa., on the Pennsylvania; Greenville, Del., and Chadd's Ford, Pa., on the Wilmington Northern; Mineral Springs, Md., and Somerfield, Pa., on a branch of the Baltimore & Ohio; Cumberland, Md., and Crooks Mills, Pa., on the Bedford Division of the Pennsylvania; Hager-

town, Md., and Mason and Dixon, Pa., on the Cumberland Valley and Baltimore and Cumberland Valley; Edgemont, Md., and Penn Mawr, Pa., on the Western Maryland; Piney Creek, Md., and Kingsdale, Pa., on the Pennsylvania; Alias, Md., and Black Rock, Pa., on the Baltimore & Harrisburg; Freeland, Md., and New Freedom, Pa., on the Northern Central; Cambria, Md., and Bangor, Pa., on the New York and Peach Bottom, making in all seventy-five quarantine stations, each of which could not be fully equipped and maintained at a less cost than \$15 a day.

Cholera; Its Home; Its Visits to the United States.

BY OZIAS W. PECK, A.M., M.D.,

Of Oneonta, N. Y.,

Member of the American Public Health Association; Permanent Member of the New York State Medical Society, etc.



UTTING southward into the Indian Ocean to about latitude 8° , and extending north to about latitude 32° , lies the old empire of Hindoostan, since, however, the empire fell a victim to British lust and rapacity, better known as India. It comprises an area of 1,383,504 square miles and a population of 253,906,449.

It will thus be seen that the population is very dense, varying from 43 to 441 per square mile; average for the entire country 184. Calcutta, the capital, has a population of 871,504, and sixty towns have more than 50,000 inhabitants. A line drawn from east to west through the centre of the country would fall not far from Calcutta, where the thermometer registers from 85° to 100° F. for seven months of the twelve.

In India, as in all oriental countries, the water supply—for drinking—is derived from wells, artificial ponds, or “tanks,” as they are called, and the rivers and smaller streams of the country. The tanks are excavations made for the purpose of collecting the surface water which falls during the rainy season and storing it for the dry. These “tanks” become simply pools of stagnant water. Not only is the water in these tanks used for drinking, but for the purpose of personal bathing and the washing of clothes, no matter how or to what extent they may be soiled. Some of the pools, like many of the rivers, are sacred, and the

waters drank from a sense of religious duty. The Ganges, a river 1600 miles in length, is an example of a sacred river in which not only those who reside along its banks, but pilgrims bathe and into which they cast their dead. This water is drank freely.

The native, when obliged to obey the calls of nature, if in the city digs a hole in or near his habitation; if in the country, he deposits his excrement where most convenient, in the fields, on the hillsides, or, and preferably, upon the banks of or in some tank or stream. The condition of the water supply, particularly the tankage, can better be imagined than described.



FIELD HOSPITAL—HAMBURG.

It has been stated in an official report to the United States Government that twenty-four high religious festivals take place annually at Juggernaut. Numerous other towns contain some temple or shrine where pilgrims come in numbers to worship.

At Juggernaut the crowds of pilgrims at the various festivals vary from 40,000 to 100,000 men and women. It is estimated that five-sixths of the pilgrims are females. Ninety-five per cent come on foot, marching, many of them hundreds and even thousands of miles. Emissaries of the temple scour the country for votaries, and every town and village contributes its contingent.

Of course, many die on the way. Those who survive the march, footsore and emaciated, rush to the sacred tanks or to the sea and bathe, don clean clothes, leaving their ragged and dirt-begrimed garments either in or on the banks of the bathing place.

For weeks before the midsummer festivals pilgrims come into Calcutta and Juggernaut by the thousands. They travel in bands, yet are often so numerous that these bands actually touch each other and march in a continuous line, like a dirty and ragged army. Arriving at the place of their destination, the cooking is done by the temple cooks and presented first to Juggernaut. This presentation renders it so sacred that not a morsel must be thrown away. Under the influence of the excessive heat putrefaction soon begins to take place, yet all must be eaten. Such food and such drink would be sufficient to make the well sick; it must, therefore, be fatal to great numbers of the worn and weary travelers, many of whom are sick with intestinal troubles before they arrive.

It would seem that with water so polluted and food so stinking that no other factors need be enumerated, and yet it is said that the lodgings are as vile and unsanitary as they well can be.

During the pleasant weather the great mass lie upon the ground, which, although more or less filthy, and notwithstanding that the air is laden with the noxious odors from putrefactive food and the putrefying bodies of hundreds of dead on the hillsides and in corpse fields, it is preferable, at least during the pleasant weather, to such shelter as is, to a comparatively limited extent, provided.

Those who have temporary shelter obtain it in hovels built upon platforms four feet high, the better of which are described as being thirteen feet long by ten broad and six and a half feet high. Through the centre of the platform is a hole which receives the evacuations of such of the inmates as do not deposit it outside of the building. In these hovels small cells or berths are provided, without windows or provision for ventilation of any kind. In the larger of these of which mention has been made—ten by thirteen feet—as many as eighty persons pass the night. I quote from Dr. D. B. Simmons, chairman of the Yokohama Foreign Board of Health: "Of 300,000 who visit Juggernaut in one season, 90,000 are often packed together for a week in 5000 of these lodgings." The great festival does not occur until after the rainy

season begins, and the excrement from the borders of the banks of rivers as well as the wash from the hillsides and corpse fields has been washed into them.

Sickness and death has been with and followed in the train of the pilgrims almost from the commencement of their journeying. Now, from weariness, exposure, excessive heat, bad air, putrid food, and water so bad that its taste and odor baffles description, an exacerbation of the intestinal troubles occur, and cholera is upon them. It claims its victims rapidly, and in great numbers. The living and the dead are crowded together, the corpse fields are full and overflowing and exposed to the glare and heat



ERIKA STATION—CHOLERA BARRACKS.

of an equatorial sun. The vultures fatten and the dogs grow lazy from gorging themselves with human flesh. Here, then, is the home of Cholera, here in the British Dominion, in its richest and most populous dependency. To what extent is England responsible? It, cholera, is here every year. It would seem to be more virulent and epidemic in its character some years than others.

It is not the purpose of this paper to trace the march of the disease to the north and west through Afghanistan, Persia and Turkestan and thence into Russia, and so on westward. It is sometimes carried across Arabia, and sometimes transported by water through the Dead Sea to Egypt. The disease may be said

to be endemic in India. Some years it goes no further; in others, according as conditions are favorable or otherwise, its progress is limited or world-wide.

The disease has been known to the profession since 1629. It first visited America and the United States in 1832, appearing on June 8 at Quebec and on June 24 at New York City. From thence it spread to Albany, Philadelphia, Cincinnati, New Orleans, etc. It remained in this country for four years. The cities of Quebec, Montreal, New York and Philadelphia then contained a population of 450,000. In these cities there were 18,000 cases and 8000 deaths. The disease disappeared from the country in 1836.

Our second visitation is spoken of as the epidemic of 1849. On December 4, 1848, the ship "New York," from Havre, arrived at Staten Island with cholera among her passengers. In 1849 it appeared in New York with great virulence. The whole number of cases reported outside of the hospitals in fifty-two days was 2631, of whom 915 died. The disease spread over the eastern and western States and to the southwest as far as New Orleans.

In 1850 the disease centre seemed to be at Cincinnati, where 1400 deaths occurred from June 1 to August 15. From May to December 824 deaths occurred in New Orleans.

In 1851 the disease centre was at St. Louis, where between April and August 766 persons died of the malady. It prevailed all over the country to some extent, Cincinnati contributing this year 200 deaths.

In 1852 the total number of deaths in St. Louis was 789. In 1853 but a *comparatively* few cases occurred, but in 1854 it acquired new energy, particularly in the west, the deaths in St. Louis being 1534. In 1855 the disease disappeared from the United States.

It thus appears that at the foregoing mentioned centres there was a total mortality of 6428 during the five years' visitation of the disease.

On November 3, 1865, the steamship "Atalanta" came into the lower bay of New York with 500 German emigrants, and cholera. Precautions taken, and no spread of the disease.

The third visitation of cholera to the United States was in 1866, when it broke out in New York about the beginning of May. It spread pretty rapidly, following the lines of travel, so

that by autumn it had extended to St. Louis and New Orleans. This epidemic prevailed extensively among the officers and men of the United States army, causing the death of more than 1200 of them.

The next year, 1867, it appeared at New Orleans in June and at St. Louis in the autumn. Thus ended the third visitation, by no means as protracted or fatal as the second one.

Our fourth visitation was in 1873. In December, 1872, and January, 1873, nearly 2000 immigrants were landed at New Orleans from the cholera-infected districts of Europe. On February 9 the first fatal case was reported at New Orleans. In



INTERIOR OF ERIKA STATION—CHOLERA BARRACKS.

April deaths were reported at Vicksburgh and Memphis; in May at Paducah, St. Louis and Chicago; in June at Evansville, Cincinnati, Wheeling, Huntsville and Birmingham, Ala. Perhaps the disease was more severe at Huntsville, Birmingham and vicinity in Alabama than elsewhere. Many other towns and cities of the south and west suffered from the malign invasion.

On September 23, 1887, the steamship "Alesia" arrived at New York from Naples with some 600 immigrants from the cholera districts. Efficient quarantine prevented the disease from obtaining an entrance into the country. The successful efforts of the health authorities of New York to keep it at bay in 1892 are

so recent and familiar to the public as to require nothing more than the mere mention of it, unless it be a word of grateful recognition to their intelligence, zeal and firmness during the trying days and weeks of the fearful menace.

So, then, we may say that cholera has knocked at our doors seven times during the past sixty years; that four times it has gained admittance; and that three times it has, through the instrumentality of energetic, intelligent and persistent means, failed to do so.

[NOTE.—The writer is indebted for the data from which this article is prepared to Dr. D. B. Simmons, chairman of the Yokohama Foreign Board of Health; Report of Michigan State Board of Health; Professor Floyd Davis, Ph.D., "Potable Water;" and *The Sanitarian* for December, 1892.]

Special Cholera Precautions for Pennsylvania.¹

BY JOSEPH F. EDWARDS, A.M., M.D.



IN compliance with the request of His Excellency, the Governor, that he should be furnished with the views of this board as to the probable danger from cholera next spring, and the measures best adapted, in the judgment of this board, to prevent an invasion of Pennsylvania thereby, your committee on "The Sanitary Supervision of Travel and Traffic," to which this subject naturally belongs, makes the following brief report:

(1) There seems no reason to question but that with the advent of warm weather this country will be in even greater danger of an invasion of cholera than it was last summer. This proposition is, I think, so well established in the minds of the members of the board, that argument to substantiate its accuracy would be superfluous and unnecessary.

(2) The invisibility and, practically, the intangibility of the cholera germ, the extreme likelihood of its transmissibility by the atmosphere, will ever nullify, to a certain extent, all efforts for its exclusion.

(3) The admission of proposition No. 2 teaches that universal cleanliness and perfection of sanitation offer the surest safeguards against the disease.

¹ A report made to the State Board of Health of Pennsylvania, December 29, 1892.

(4) But since such ideal conditions cannot be expected until the people *en masse* become more actively impressed with their importance, then does it seem—

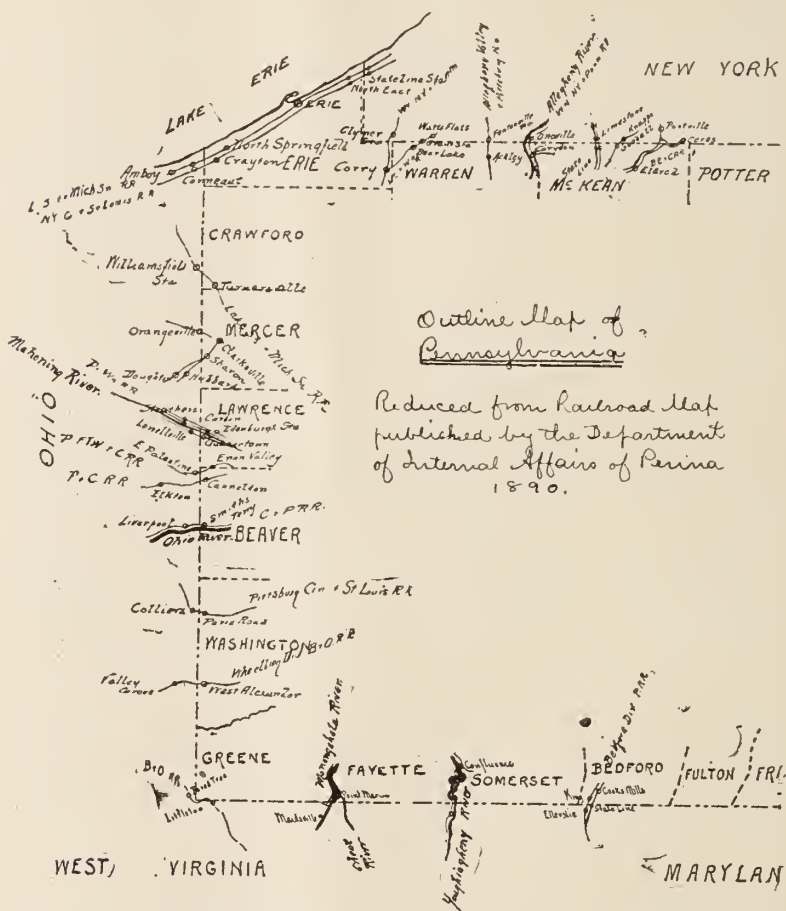
(5) That the precautions necessary to save this State from an invasion upon the approach of warm weather should be of a dual nature; first, that we should seek the co-operation of the press of the State to impress upon the people the importance of securing and maintaining absolute cleanliness and of careful and correct modes of life; and, secondly, that this board should outline a system of inspection, ready to be put into operation at a moment's notice, calculated to prevent, as far as possible, the introduction of the disease within the borders of the State. It is rather to offer a plan of action to meet this latter suggestion that this report is made. From the map accompanying this report it will be seen that there are fifty-nine points at which railroads enter this State and thirteen points of entry by river, making seventy-two possible points of entry for cholera should the disease exist in any of our bordering States.

Of these seventy-two points there are thirteen that seem to me to possess a special significance in this connection, viz., Easton, for the Lehigh Valley R. R.; Morrisville, for the Pennsylvania R. R.; Yardley, for the Philadelphia and Reading R. R.; Experiment Mills, for the Delaware, Lackawanna and Western R. R.; Great Bend, for the New York, Lake Erie and Western R. R.; Hallstead, for the Delaware, Lackawanna and Western R. R.; North East, for the Lake Shore and Michigan Southern R. R.; North East, for the New York, Chicago and St. Louis R. R.; Cooks Mills, for the Pittsburg Division of the Baltimore and Ohio R. R.; Cooks Mills, for the Bedford Division of the Pennsylvania R. R.; New Freedom, for the Northern Central R. R.; Lanesborough Junction, for the New York, Lake Erie and Western R. R.; and Camden, N. J.

Leaving Camden, N. J., for subsequent consideration, I would suggest that at the remaining twelve important points of entry we should have an inspector board every train in the neighboring State, at a point one hour distant from the State line, and make a careful but unostentatious inspection of the passengers. We should require the conductor of each train to furnish to this inspector a statement, under oath, that there has been no suspicious case of sickness on his train. If a supposed case of cholera exists or occurs, the car should be at once vacated by all but the sick person, and, as soon as the train enters

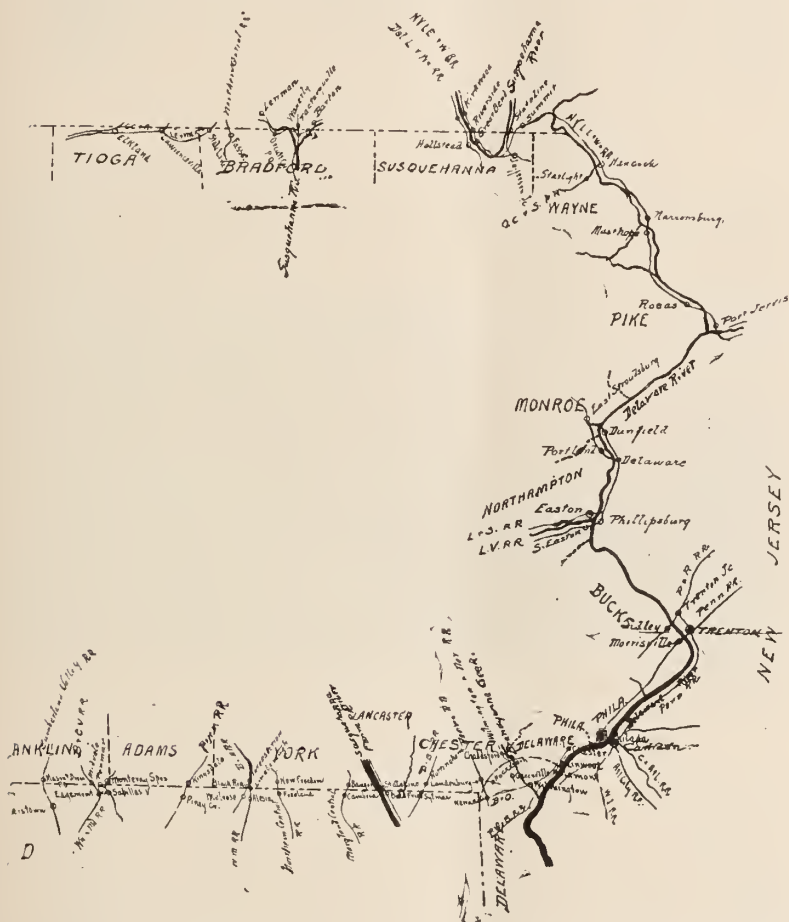
Pennsylvania soil the car should be side-tracked. Arrangements should be previously made to have tent hospitals ready at each of these twelve points.

At the remaining forty-six points of railroad entry we should have an inspector ready to board every train at these points, and



we should require the conductor of every train to furnish, under oath, a certificate or statement to this inspector that there is not and has been no suspicious sickness on his train. In the case of immigrants, the inspector should turn back any one who is not armed with a proper certificate from the quarantine authorities of the port at which he has entered.

In Camden, N. J., we should have inspectors always on duty at the termini of both the Pennsylvania and Reading Railroads. Every arriving train should be watched, and if any suspicious cases are noted they should, if possible, be kept from entering the ferry boats; but, if this be impossible, they should be followed



and not be allowed to land in Pennsylvania. Inspectors, similarly instructed, should be provided for the thirteen points of entry by water (rivers), as also for the canal routes.

All of the railroads entering this State should be respectfully notified of our proposed course of action, and their co-operation solicited.

We should notify all railroads that if they bring a case of cholera into the State, that thereafter all trains will be detained at the State line for examination.

We should request the city boards of health of Philadelphia, Pittsburg and Erie to have a vigilant supervision over the packet traffic between their own and other cities. It goes probably without saying that our inspectors should not neglect the belongings of suspicious cases. To carry out the suggestions above made we would require :

At twelve points, four inspectors each	48
At Camden	12
At forty-six points, one inspector each	46
To provide for emergencies	19

Making a total of 125 inspectors.

We should be prepared to employ these inspectors, if necessary, for six months, and we should pay them ten dollars per day, for which we would require \$225,000. For incidental and unlooked-for expenses we would require at least \$25,000. We should, then, it would seem, ask the governor to request the legislature to make an appropriation of \$250,000, to be used, if necessary, in resisting an invasion.

Should our recommendations meet the approval of His Excellency and of the legislature, then this committee would ask for the sanction of the board for it to appoint inspectors at the points indicated, the appointments to take effect only upon the approach of the disease. As soon as we hear of a case of cholera in any city or town having railroad or water communication with Pennsylvania, then should we be prepared to start, by wire, our inspection system on all roads leading from such place.

To the efficient working of this system our inspectors should be empowered to administer oaths.

The above is but an outline, suggested for the action of the board; of course, in the event of an invasion, many contingencies would arise that must be left to the discretion of the executive officer of the board. Such a system would interfere to a minimum degree with the business of our transportation companies, and ought not to prove objectionable to any one.

Recommendations in View of a Cholera Invasion.¹

BY DRS. J. H. MCCLELLAND, PEMBERTON DUDLEY AND
GEORGE G. GROFF,

Members of the State Board of Health of Pennsylvania.



IRST.—That concert of action be secured among the sanitary authorities of all the States and municipalities through which the main lines of travel extend between the ports of Europe and the city of Chicago, and that the steamship and railroad lines be solicited to co-operate



AMBULANCE CONVEYING A CHOLERA PATIENT TO THE
BARRACKS AT HAMBURG.

in such arrangements and regulations as may be adopted. The object of such concerted action shall be to reduce to a minimum the delay and vexation arising from inspections of passengers and baggage at numerous points on lines of travel. Also, that a conference of State boards of health be held with a view to that object.

Second.—That, in the event of the actual appearance of cholera within the limits of the United States or adjacent countries, this board shall adopt and enforce such additional regulations as

¹ The report made by a Special Cholera Committee to the State Board of Health of Pennsylvania.

may be deemed necessary to protect this Commonwealth from an invasion of the disease.

Third.—That the Secretary shall issue a letter of instructions giving careful and detailed directions to all the cities, towns and boroughs of this State for diminishing the danger of an outbreak of cholera, and lessening its virulence in the event of its actual appearance; also including instructions governing the sanitary management of all cases of cholera occurring within the jurisdiction of this board, with regulations for the isolation of infected persons, the disinfection and disposal of all infected material, together with stringent injunctions against the contamination of



A DISINFECTING SQUAD—HAMBURG.

any stream or well with cholera dejecta, and a statement of the penalty for violation of this regulation.

Fourth.—That a circular letter on cholera, with directions to householders and individuals for the protection of the home and person against the disease, be sent to all the newspapers published in the State; said circular letter shall give special instructions in the modes of using disinfectants during the presence of the malady, the precautions to be taken previous to the arrival of the physician, and a notice of the penalty for infecting any stream or well with cholera discharges.

Fifth.—That the board appoint special supervising inspectors

in each county, provided that wherever any legal health officer already exists no such supervising inspector shall have jurisdiction. In case cholera makes its appearance in this State, such special inspectors shall be immediately empowered by the executive officer of the board to supervise the sanitary management of all cases of cholera occurring in their respective districts and to enforce the rules and regulations of the board in relation thereto. It shall be the duty of said special inspectors to notify the Secretary of the State Board of Health by telegraph of all outbreaks of cholera coming under their notice.

Sixth.—That all physicians practicing in this Commonwealth be supplied with suitable blanks for the purpose, and required to make immediate report to the proper supervising inspector of all cases of cholera coming under their professional knowledge. Said report shall include the patient's name, age, sex, color, nativity, duration of residence (if a foreigner), and the supposed source of the infection, and shall also mention the measures taken and directions given by the physician to prevent the spread of the disease, the mode of disinfecting the excreta, and the means taken to prevent the infection of any stream or well.

Seventh.—That the board formulate and adopt "regulations" covering all the above requirements, and notify all physicians practicing in the State of the adoption of such regulations, with the penalties for violation thereof.

Means of Protecting the Milk Supply.

BY WILLIAM H. FORD, M.D.,

President of the Board of Health of Philadelphia.



OW best to guard the milk supply against adulteration and impurity is a question for serious consideration. Various plans have been suggested, but that most commonly practiced has for its primary and almost exclusive object the detection of adulteration. It is insufficient, however, to guard the supply against a form of contamination which is the more serious because capable of directly communicating disease.

The economic and sanitary advantages of milk inspection should not be undervalued. The sale of milk as pure milk, to which water has been added, or from which a part or the whole of the cream has been abstracted, or both, is a deception deliberately practiced with a view of gaining an unlawful or unfair advantage, and is, therefore, a fraudulent act which inflicts pecuniary loss upon the purchaser. But a more serious consequence of these common forms of adulteration is the injury liable to be caused to the health of the consumer. The effect of lowering the nutritious value of an article that is so much depended on in the sick room, that at times constitutes the sole food of infants and that enters so largely into the diet of most individuals, needs no explanation.

The grosser forms of examination supplemented by chemical analysis serve a most useful purpose in discovering adulteration, but even the most searching chemical investigation fails to detect the contagion of diseases which milk, as a vehicle, is capable of conveying.

It is a fact, proved by abundant evidence, that disease may be communicated through the medium of milk contaminated at the dairy farm, dairy, or milk shop. Epidemics of scarlet fever, diphtheria, and typhoid fever have been traced to this source, and it is extremely probable that tuberculosis can be propagated in the same way. The occasional spread of other forms of disease has been thought to be connected with disease in animals from which the milk was obtained. Attention has been called to cases of throat illness accompanied with symptoms similar to those developed in cattle suffering from foot and mouth disease, which can be explained in no other way except by the fact, well ascertained, that the milk used has been supplied from farms where foot and mouth disease existed.

Mr. Firth discovered in milk which had produced severe gastric symptoms a principle or ptomaine which he named lactotoxine. And Professor Vaughn has isolated a poisonous principle in milk which had produced symptoms of a gastro-intestinal irritant, with marked effects upon the nervous system, which he has named tyrotoxicon, and designated it as belonging to the class of ptomaines. It is not unlikely that this organic poison is frequently the cause of the so-called cholera infantum. Cholera has been conveyed by milk which had been diluted with water contaminated with the poison of this disease. Milk may be poi-

soned by the cows feeding on improper food. As an illustration, it may be stated that the milk of animals afflicted with the "trembles," supposed to be caused by the cows feeding on rhus toxicodendron, has produced "milk sickness" in children, with symptoms of vomiting, dry and swollen tongue, weakness, fall of temperature, and constipation.

Chemistry is invaluable in discovering some of these toxic matters, in revealing the physical characteristics of milk, and in detecting adulteration, consisting in removal of the fat and in the addition of water and other foreign substances; but it fails to detect those subtle organic forms of matter, the so-called disease



STATION FOR BOILING WATER AT MESSBERG.

germs, which may be and are not infrequently conveyed in milk. We must look elsewhere for the means of preventing or of detecting infection of milk.

Fortunately, we have at our command a method which, though as yet limited in its practical results, promises to supply this deficiency. Biological investigation opens a new field of exploration, and is a valuable means of supplementing chemical analysis. What one fails to discover the other may possibly bring to light. It is not expected, however, that biological investigation is an unfailing means of detecting the pathogenic organisms that may be conveyed in milk, nor that it is the best practical means

of insuring the milk supply against disease contamination. But as an auxiliary to the older forms of laboratory work it is most advantageous, and the best results are to be obtained when the two modes of investigation are combined. If biological investigation were only occasionally the means of detecting the tubercle bacillus in milk, this result would be of sufficient value to compensate for all labor expended in the investigation, for by it the herd from which the milk was derived could be discovered, and the tuberculous animal or animals whose milk, day after day, poisoned the entire supply, could be quarantined or destroyed, according to circumstances.

The investigation need not be confined to tuberculosis. Although the range of investigation is narrow and the practical results to be obtained limited, the knowledge of the contagion of other diseases is sufficiently precise, and the methods of detecting them sufficiently exact, to make the search for morbid matter which is occasionally conveyed in milk not altogether fruitless. The science of biology has made great progress within recent years and is constantly adding to our knowledge of the rôle played by micro-organisms in the causation of disease. Such knowledge should be made use of whenever practicable in preventing disease and in conserving health. The practical application of tuberculin in detecting latent tuberculosis is of immense advantage in guiding measures for the eradication of this disease in its early stages from among herds of cattle.

While milk inspection, aided by laboratory tests, is invaluable in guarding the milk supply against adulteration and contamination, it is evident to any one conversant with the subject that the results of the best conducted service are limited, for it is impracticable to test more than a small fractional part of the milk that goes into consumption. And, moreover, in many instances the suspected article has been consumed before the results of examination have been fully developed. It is not intended to throw discredit upon this service, as it is indispensable in directly intercepting adulterated milk and certain forms of impurity, and it has the moral effect of deterring many from engaging in an unlawful practice through fear of the law and the consequences of its violation. But it is our purpose to point out the necessity of establishing a co-operative system of inspection whose field of investigation is at the dairy farm itself, which is the principal source of contamination. This service has the important object

of insuring the purity of milk at the very source of the supply, by excluding all diseased animals from the herd, maintaining the health of the cattle, and eliminating all agencies which may affect injuriously the cattle and the milk.

The absence of systematic inspection of dairy farms, dairies and milk shops exposes the community to dangers which they do not suspect, and which they have no means of detecting or averting. Milk inspection, as generally conducted, is able to lessen if not to entirely prevent the various forms of adulteration, but it fails to discover the subtle poison of disease, which gives no evidence of its presence except by its effects. It is true that the



WATER WAGON OF A BREWERY.

pasteurization of milk, that is, heating it twenty to thirty minutes at a temperature of 160° F., reduces the probability of its infectivity to a minimum; but this practice, though extremely simple, is not generally observed. It is to the civil authorities the people look for protection, and it is their duty to guarantee it by all possible means.

Dairy farm inspection is required by the English law, and to some extent is carried out, but in this country it is almost entirely neglected. Steps are being taken here and there to secure legislation on this subject, as it begins to dawn upon the people that there is a positive need of this service for the protection of the

public health. In anticipation of this demand, some milk purveyors have announced the voluntary adoption of a system of inspection of herds of cattle from which their milk is obtained, with certificates of the health of the stock. Although advertisement of the plan is intended to influence patronage, the enterprise would not have been volunteered without the conviction that the public are ready to appreciate its advantages.

The necessity for constant supervision is based upon the fact that milk is liable to be contaminated in many ways before it reaches the house of the consumer. It may be contaminated at the dairy or at the milk shop by the addition of impure water, or



BORING A WELL IN HAMBURG.

by exposure to unhealthy effluvia; but it is at the dairy farm that the greatest danger is to be encountered. Epidemics of typhoid fever, scarlet fever and diphtheria have been clearly traced to infected milk. Typhoid fever has been communicated by milk contaminated by water used in rinsing cans. The milking of cows by persons convalescing from contagious disease has been the means of conveying infection. There is a possibility of infection from anthrax or malignant pustule and from foot and mouth disease, but the danger from these sources is slight, as it is to the interest of the dairyman to exclude from his herd animals suffering from these diseases. Whether or not actinomycosis, caused

by the malignant ray fungus, can be communicated by milk is a disputed question, but until this is decided cattle suffering from this affection should come under the ban of the inspector.

It is proposed to lessen the frequency of these dangers, if not to avert them altogether, by the provision and establishment of a thorough and effective inspection of dairy farms. Such inspection should embrace a searching inquiry into the health of the cattle, the condition of their environment, the manner of feeding and housing the stock, of preparing and handling the milk, the location and quality of the water supply used by the cattle and used for cleansing the milk vessels and for cooling the milk; it should also guard, as far as possible, against the danger of infection possibly derived from the dairyman's family or from among those handling the milk.

Should contagious disease invade the dairyman's family, he should be prepared by previous instruction to guard the milk supply against this source of danger. A more intelligent co-operation would be secured and the work of inspection greatly facilitated if printed instructions and rules were prepared clearly outlining the duties of the dairyman to the public, so far as they relate to the adoption of measures that will insure wholesome milk.

If a rigid sanitary inspection of dairy farms, dairies and milk shops, as outlined above, be conducted in connection with milk inspection, supplemented by laboratory tests, as now practiced in cities, there will be the assurance that nothing is left undone to guard the milk supply against adulteration and contamination.

In order to make inspection uniform and comprehensive the law governing it should be made to apply to the whole State. The supply of towns and cities may be derived from distant counties, and local regulations would therefore be imperative in such districts. The right to sell milk should be conditioned upon the possession of an official certificate or voucher of inspection.

In the absence of authorized general inspection, the municipality can protect itself by prohibiting the sale of milk, unless reliable evidence is presented to the effect that the farm whence the supply is derived is periodically inspected and with favorable results, or unless the proprietor submits to inspection by local officers.

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**Pan-American Medical Congress.—Section on
Hygiene, Climatology and Demography.**

PERSONS proposing to present papers before this section are requested to communicate with either of the undersigned *immediately*, that titles of subjects may be properly classified for the programme of the proceedings of the Congress. The only limitation as to subject-matter is that it shall have a sanitary, climatological or statistical bearing. Members of the Section on State Medicine of the American Medical Association, the American Public Health Association, the American Climatological Association, the American Academy of Medicine and of State and Municipal Boards of Health are especially invited to contribute the results of their several experiences. The languages of the Congress being Spanish, Portuguese, French and English, papers may be presented in either, to be translated in the others, for which reason their text should be in the hands of the Secretaries at the earliest possible date.

ALBERT L. GIHON, M.D., President,
145 East 21st Street, New York City.

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129 East 17th Street, New York City.

PETER H. BRYCE, M.D., Secretary (English),
Toronto, Canada.

Our Hampered State Board of Health.

WE ask our readers to carefully read the appended statement, and when they realize therefrom the niggardly way in which the State Board of Health of this great State is treated, for each of those who feel that things should be different to write to the Chairman of the Appropriations Committee of the House of Representatives at Harrisburg and urge upon him the importance of an adequate appropriation to this Board.

Statement Showing Usual Amount of Annual Appropriation to the Principal State Boards of Health in the United States in the Order of Comparative Amount of Appropriation.

State.	Amt. of Appro.	Popul'n, 1890.	Expense per capita.	Estimated Wealth, 1890.
Louisiana. ¹	\$70,000	1,118,587	62.50 mills	\$ 382,000,000
Massachusetts.	49,000	2,238,943	21.66 "	2,623,000,000
New York.	30,000	5,997,853	5.0 "	6,308,000,000
Florida. ²	21,000	391,422	54.0 "	120,000,000
New Jersey.	16,000	1,444,943	11.0 "	1,305,000,000
Maryland.	13,600	1,042,390	13.0 "	837,000,000
Alabama.	9,000	1,513,017	5.88 "	428,000,000
Illinois. ³	9,000	3,826,351	2.33 "	3,210,000,000
Minnesota.	9,000	1,301,826	6.88 "	792,000,000
Michigan. ⁴	6,000	2,093,889	2.88 "	1,580,000,000
Pennsylvania:	6,000	5,258,014	1.14 "	4,942,000,000
Wisconsin.	5,200	1,686,830	3.06 "	1,139,000,000
New Hampshire.	3,500	376,530	9.33 "	363,000,000
Rhode Island.	3,000	345,503	8.66 "	400,000,000

The Pennsylvania Board is required to do the work of local boards outside of large cities, which is not the case with other State Boards.

Five Thousand Little Headstones.

FIVE thousand little graves are dug each year in Philadelphia for little babies, and 5000 little headstones are yearly set up over their graves, all due to deaths traceable to the diseases which spring from wrong feeding. In the overwhelming majority of instances the poor food of which the babies die is bad milk, diseased milk, or skimmed milk.

¹ Louisiana. Partly for quarantine purposes.

² Florida. Partly for quarantine purposes.

³ Illinois. This Board has a special fund of \$10,000 for emergencies.

⁴ Michigan. This Board has a special fund of \$10,000 for emergencies.

Death's heavy harvest of little babies in Philadelphia is rendered possible by the absence of a sound milk law.

So says the *Philadelphia Press* of recent date, and most heartily do we endorse the sentiment. While the whole country is anxiously fearing an invasion of cholera, we are inclined to agree with the recent utterance of Dr. Shakespeare, that even more to be feared than this dreadful disease is the milk supply of our infant population. Hence do we consider ourselves particularly fortunate in being able to lay before our readers (see page 235) an able article on this subject by so high an authority as the president of the Board of Health of the City of Philadelphia.

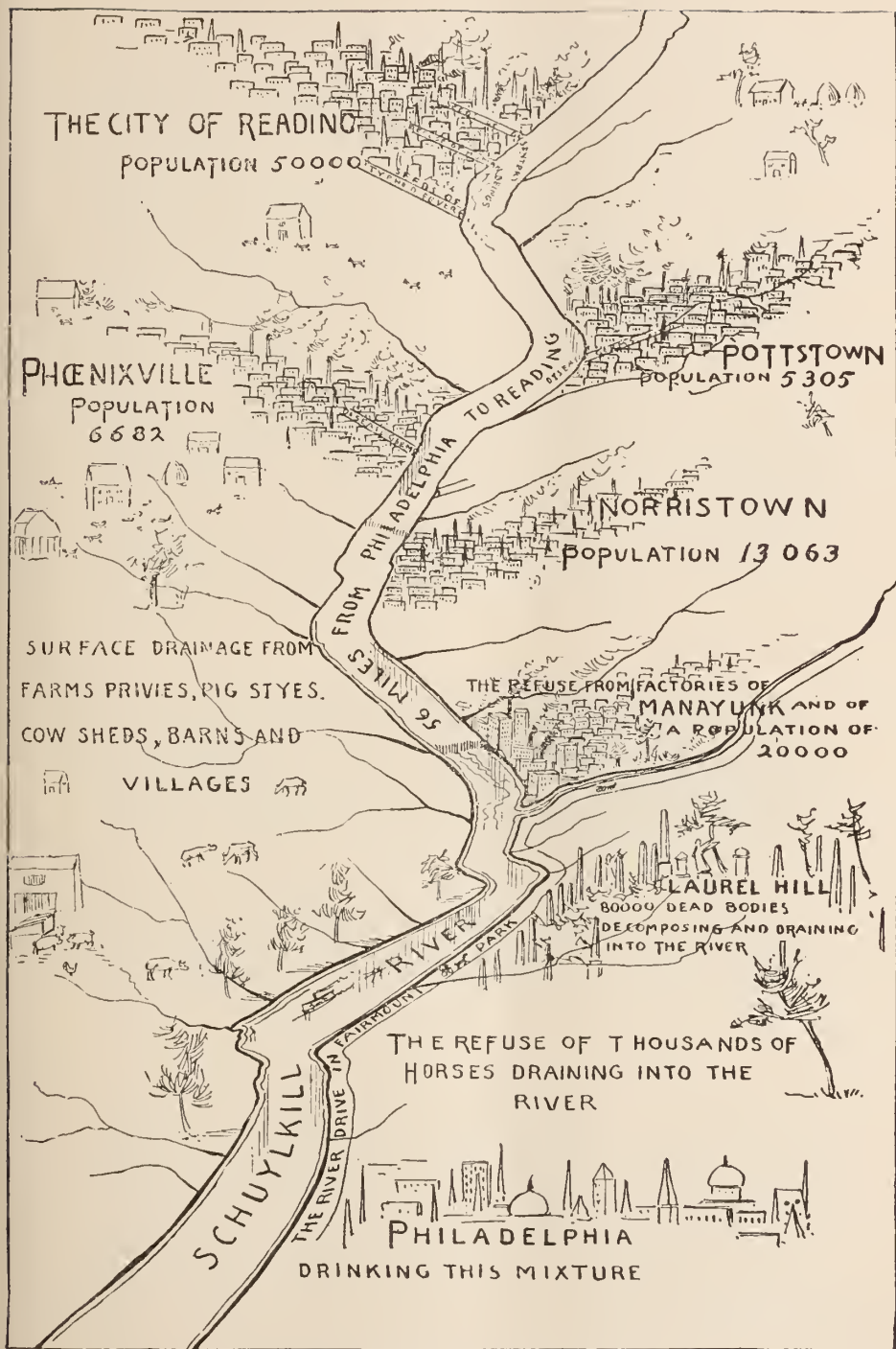
Philadelphia's Possible Danger from Cholera.

DURING the past winter the engineer member of the State Board of Health, Mr. Howard Murphy, C.E., has been hard at work, and he is still earnestly striving to meet a threatened danger to this city should cholera become prevalent in any of the towns up in the Schuylkill Valley.

A glance at our diagram will explain the danger better than volumes of words. It is clearly within the comprehension of any one that a single case of cholera in the Schuylkill Valley might so pollute the water supply of Philadelphia as to cause an epidemic of unparalleled magnitude in this city. The danger is a real one, and we earnestly urge every one to be fully alive to its possible reality. For the means of prevention, we must have for our State Board of Health a liberal appropriation from the legislature, and we must have unceasing vigilance in the Schuylkill Valley, so that, should a case of cholera occur, the discharges may be prevented from draining into the river.

Domestic Infelicity and Disease.

DOMESTIC infelicity is, we are inclined to think, more frequently caused by ill health than the public have any idea of. Of course, there are very many illy-advised marriages, which must, in the course of nature, inevitably prove unsatisfactory and unhappy, but then, again, one often sees a married couple who for years have lived contented and happily together suddenly develop an incompatibility that seems inexplicable. After having for years lived in harmony and peace, the home becomes



THE WATER SUPPLY OF PHILADELPHIA.

the scene of discord and bickering, of crimination and recrimination, and, possibly, of estrangement and ultimate separation that wrecks the happiness of two lives, and if, perchance, there are children, makes misery untold for them.

Now, while we are prepared to admit that other than physical factors may be at the root of the trouble in some cases, we are yet quite firmly convinced that chronic ill health, of one or both, is very frequently the cause of this seemingly inexplicable incompatibility after years of felicity.

Acting upon this hint, we believe that much misery would be avoided if, when a couple who have been married happily for years, find themselves commencing to disagree and quarrel upon the slightest provocation, the services of an intelligent physician were enlisted to ascertain whether there be not some organic disease at the bottom of the trouble.

There can be no possible doubt but that chronic dyspepsia has succeeded in ruining many a previously happy household.



For Kicking Babies.

Kicking babies, predisposed to throat trouble, are put to sleep in bags of eiderdown or thick flannel. A draw string ties about the neck, and the novel nightgown being roomy, baby is allowed to kick all night if he pleases, fearless of croup, cold or catarrh.

Catching Cold.

Colds and acute lung and bronchial troubles are not nearly so much due to our climatic conditions as to our abuse of the means of protection against cold. The abuse is in living in unventilated rooms and heating them to a temperature above 70°—often much above. Hunters and trappers in our northern woods rarely “take cold,” and the same is true of Arctic explorers.
—*Sanitary Inspector.*

Tobacco and Cholera.

The Berlin correspondent of the *British Medical Journal*, referring to the large trade in cigars manufactured in Hamburg, states that experiments made in the hygienic institute in the Berlin University have shown that the cholera bacilli die more quickly on dry tobacco than on dry glass-plates; that they do not multiply but quickly die on moist tobacco, and that tobacco smoke quickly kills the bacilli.

A Popular Error About Water.

The impression that a spring or well water taken from the rock or ledge has a guaranty of purity is a serious popular error. Water in passing through a deep layer of porous soil or sand undergoes a process of filtration, oxidation and purification. Rock, on the contrary, has no power to purify, and its surface or its crevices sometimes convey polluted surface drainage long distances into wells or springs.—*Sanitary Inspector.*

Wire Mattresses in Lodging-houses.

At a recent meeting of the New York City Board of Health, Dr. Joseph D. Bryant, as chairman of the Sanitary Committee of the Board, recommended that all the lodging-houses in the city should be equipped with wire mattresses, to take the place of the textile mattresses now used. He also advises that in every lodging-house there should be provided a room for isolating lodgers suffering from, or suspected of being affected with, contagious diseases. The board of health has ordered that after April 1, 1893, wire mattresses and isolation be required for lodging-houses.

The Tramp as a Carrier of Disease.

The tramp, as a carrier of infectious disease, deserves attention, particularly in country districts where he swarms during harvest time (says *Public Health*, in Minnesota). Smallpox and typhoid fever have come to us in this way. It is cheaper for the local boards to give such men an opportunity to boil their clothes and wash themselves, as a condition of being allowed to remain, than to care for them or others sick through infection they may bring. The one costs nothing but hot water, soap, the use of a wash tub and a little time, the other causes suffering, possible death, and is a heavy draft on public and private funds.

Alcoholism and Degeneration.

In the Commune of Fauborn, near Limbourg-sur-Lahn, in the Grand Duchy of Hesse-Nassau, there are several distilleries, and the population appears to be composed of cretins and examples of degeneration of all descriptions. The contrast is the more striking as in the neighboring villages which contain no distilleries the population is healthy.—*Le Progrès Médical*.

A Lurking Danger.

It is no new thing that stamps and envelopes should be blamed as a cause for numerous petty illnesses which occur to those who constantly use them, says *The Lancet*. The connection between a habit of licking the gummed surface and an irritated tongue is not entirely imaginary. The mere contact of the mucous membrane with an adhesive substance, if often repeated, must encourage abrasion of the former. Another element of danger exists in the well-known impurity of office gum. It is usually as easy as it is advisable to avoid licking stamps, and it is never safe to apply them to a wound.

Strange Idiosyncrasies.

A writer in the *Medical News* knows a family of which the female members for several generations have been unable to eat strawberries without genuine and decided symptoms of poisoning ensuing. The male members of the family eat them as others do, but a single berry given by a disobedient nurse in a few hours killed a little daughter of two years. Dejean says that the celebrated Hachu was thrown into convulsions whenever he dared to eat strawberries.

Probably the most remarkable case of idiosyncrasy on record is that of David Waller, described in detail by Dr. Overton in the *Southern Journal of the Medical and Physical Sciences*, Vol. III, 1855. In all other respects Waller was a healthy, normal man, born of healthy parents. Seven brothers and sisters were free from it. But to this poor man life became almost unendurable because for him wheat flour was poison. Unbelieving friends would deceive him, and put a pinch of flour into his food. Trusting them, he would eat, but the violent toxic symptoms never failed to follow.

Longevity in Japan.

The population of Japan, according to the *Sei-I-K'wai Medical Journal*, is about forty millions and a half. What is especially noteworthy is the large number of persons who attain the age of one hundred years and upward. At the end of 1890 there were 81 persons 100 years old, 46 of 101, 25 of 102, 7 of 103, 6 of 104, 1 of 105, 7 of 106 and 3 of 107. In other words, the total number of persons whose vital innings had reached "three figures" in the Japanese empire is 177, and the united ages of the "century" community yields the astonishing total of 16,937 years. The proof that the Japanese must have the faculty of longevity among them is further shown by the fact that in the aged decade (90 to 99) there were living there at the end of 1890 11,245 persons, a stupendous number indeed.

"A Filthy and Poisonous Rite."

A fortnight since we drew attention (says the *Lancet*) to the unbiased testimony of a Roman Catholic priest to the efficacy of vaccination based on his personal powers of observation exercised in the performance of his self-sacrificing and Christian duty. To-day, in strange contrast with that experience, we are confronted with the *ex cathedra* utterance of a member of another profession, one from whom we might expect a judicial estimate of the subject. To be sure this gentleman has not, like the good priest, himself come into contact with smallpox patients; he has not seen the ravages it creates among the unvaccinated and the vast amount of suffering and death it inflicts upon unprotected children. His strong remarks are purely based on *a priori* considerations, on violent mistrust of the medical profession, as well as on the ground of interference with the liberty of the subject. He talks of the "medical despotism" which imposes the "filthy and poisonous rite" of vaccination upon a subservient nation, and he informs the world that "some of the noblest" of our ranks are on the side of anti-vaccination. It is, perhaps, mere waste of time and energy to meet this effusion in the way it deserves, but we would ask Mr. Hopwood, Recorder of Liverpool, one plain question: Does he believe that the medical profession advocate vaccination and re-vaccination in their own interests or in those of the community whom they serve? There can only be one answer to that question, but it is not the one which fits in with the terms of the letter which has led to these remarks.

Disinfection of Rooms.

The question is often asked whether articles that will be damaged by the disinfecting agent may be removed from a room where contagious sickness has been prior to the process of disinfection, and we answer this query with the words of *Good Health*, that "in the disinfection of rooms everything which has been in the room during its occupancy by a case of infectious disease should remain during the disinfection; all pictures, upholstered furniture, organs and similar articles, which are likely to be injured by a fumigation should be removed before the patient is put into the room. An organ would doubtless be utterly ruined by the fumigation, as would also an ordinary gilt picture frame, as the sulphur fumes would attack the metal reeds, and would be likely to take all the gilding from the picture frames. Such articles may be disinfected by other means, as, for example, by wiping with a 5-per-cent. solution of carbolic acid or a 1-2000 solution of corrosive sublimate. Corrosive sublimate will discolor metal articles with which it is brought in contact; it can be used only for wood furniture or varnished surfaces.

Public Urinals a Public Necessity.

Public urinals are a public necessity, according to the *Doctor's Weekly*, which says that \$15,000 is a conservative estimate of the amount of money spent each day in the liquor saloons of the city of New York by persons who would not patronize such places but for the privilege obtained thereby of using the urinals found therein. From personal observation we are inclined to regard these figures as much too low. There are only a few public urinals in the city and they are inconveniently located, yet they are crowded at all hours of the day. We have never been able to understand why the municipal authorities of this and all other large American cities have not made some effort to supply this long-felt want. Our temperance and sanitary friends ought to feel called upon to agitate the subject. They could easily get together such facts and figures as would convince the most indifferent member of our health board that the erection of public urinals would contribute greatly to the health, comfort and convenience of our citizens, to say nothing of the thousands of dollars kept out of the till of the rumrunner.—*Medical Review*.

Some Yearly Appropriations for Sanitary Purposes.

New York City	\$435,000
Massachusetts	111,300
Texas	61,000
Illinois	49,000
Mississippi	46,000
Minnesota	29,000
New York State	25,000
Florida (about)	23,000
New Jersey	21,000
Wisconsin	20,000
Michigan	16,000
Alabama	13,000
Maryland	13,000
California	12,800
Connecticut	10,000

—*Florida Health Notes.*

[*Now, ye residents of the great Keystone State of Pennsylvania, stand erect, full of pride and self-gratulation, for your noble State with unequaled liberality appropriates the fabulous sum of \$6,000 per annum.*—ED.].

More Scientific than Clean.

German physicians and surgeons, in their own country, are the most pronounced in the profession on the subject of antiseptic treatment of disease, and antiseptic surgery. They have outdone Lister many-fold in their attention to aseptic and antiseptic precautions. Their invention of antiseptic applications, and their attention during operations, in the way of dress and sterilizing apparatus, to all the details that tend to the destruction of bacilli, are to some even painfully painstaking and minute. Yet, with all the theory and practice of the profession, in Germany, on this subject, the people are far behind the English (we won't say the Americans, lest we be suspected of egotism) in real sanitary service. The sewerage of their towns is notoriously defective. The smells that come from their narrow streets are appalling even to a New Yorker, who may be supposed to be pretty thoroughly accustomed to smells and dirt. And the arrangement of their domestic hygiene, in their great buildings, in their hotels, especially as to baths and lavatories, leaves very much to be desired. In other words, unpleasant as it may sound, the English race, as it appears to the average traveler, is a much cleaner one than the German, although the latter is far more scientific.—*Post-Graduate.*

“Faith Cures.”

This subject has been recently discussed in the pages of one of our contemporaries by so able a physician as M. Charcot. His treatment of the subject is very calm and impartial. After showing that in all ages the conditions affecting the successful application of the faith cure have been practically identical, he emphasizes the following important points: (1) That a special disposition on the part of the patient is necessary to success—a disposition fostered by the mental exaltation incidental to religious pilgrimages; (2) that the diseases usually benefited have been of a convulsive or paralytic order—that is, they belong to the category of functional disorders “which demand for their cure no intervention beyond the power which the mind has over the body;” and (3) that the domain of faith healing has thus a limited application. M. Charcot, however, deals with the matter in no dogmatic spirit, nor does he restrict within too narrow limits the trophic influence of the nervous system. Mention is made of the remarkable case of a patient in whom a “hysterical œdema” of the breast resulted in extensive and long-continued sloughing and who was at the same time the subject of a profound hysterical paralysis of the left side. The sores, mistaken for cancer, rapidly healed and the paralytic symptoms disappeared.

The Microbe and Early Medical Lore.

It is curious to observe how from time to time different people lay claim for their own special school or their own country to the discovery of a bacteriological etiology of disease. The recent Oriental Congress calls to mind Pandit Janardhan's article on “Disease Microbes Anticipated in Sanskrit Medical Works,” which appeared in the April number of the *Imperial and Asiatic Quarterly Review*. It must be confessed that he does not bring forward anything to prove that naked-eye parasites were the cause of disease, and his illustrations in support of his theory that Indian sages looked upon organic germs as the cause of disease scarcely warrant the interpretations he puts upon them. He depicts the ordinary forms found on many of the older manuscripts and tablets; snakes, scorpions (or something like them), pediculi, star-fish, tadpoles and, curiously enough, as if the draughtsman had had some quaint conceit in his mind, outlines

of manikins such as most of us have drawn on our slates during the earlier period of our lives. The article is exceedingly interesting, but we must, throughout, read "worms" or "animal parasites" for microbes, for of the presence of the microbe in the mind's eye of the earlier medical sage there is little or no evidence.

The Health of School Children.

Among the numerous associations which have recently applied for public assistance in carrying out the work entrusted to them is the committee appointed by the Council of Hygiene (1891) to inquire into the physical and mental condition of children in relation to their education. The investigations instituted by the committee, as we learn from its latest circular, have not been fruitless. Altogether some 50,000 children attending 106 schools have been examined. These establishments included homes, orphanages, industrial and public elementary schools and those under the control of the poor-law. The condition of the children, as described by the committee, is by no means encouraging, though we may gather some hope from the fact that the unhealthy state of many of them did not necessarily imply any marked reduction of the normal standard. Thus, while nearly 6000 presented "bodily defects," 5000 showed "deviations from the normal nerve state," 2000 were pale, thin, etc., 3600 were reported as "mentally dull," but only 288 as crippled, deformed or subject to fits. Without a more intimate knowledge of the meaning of such general terms as the above, it is impossible to form a clear idea of the educational capacity of these children. It is sufficiently evident, however, that the physique of a large proportion of them was perceptibly inferior. It is also a significant fact, as bearing upon questions of hereditary incapacity and of low nutrition as related to such incapacity, that this injurious variation was chiefly noticeable among pauper children and those of criminal parents. The questions whether "over-pressure" was not really another name for "under-feeding," and whether the standards of education were equally suitable to all cases, naturally suggested themselves to the committee. Though still without sufficient data to afford a basis for generalization as to the most appropriate methods of instruction, they are evidently of opinion that some readjustment of the strain thus imposed on weak children is called for. Whether this can best

be brought about by varying the amount or quality of the work exacted in any case, or by such arrangements for better nutrition as may appear to be needful, is open to further discussion. A combination of both methods would probably attain the best results. There might also be some advantage in rearranging the hours of work. We cannot but think that if these were more concentrated, so as to leave the better part of the afternoon free from school work, a material gain would be achieved. A reasonable amount of home preparation would then be possible, and this might obviate the fagging drudgery of such preparation carried out late in the afternoon by children whose brains were already wearied by several hours of scholastic labor.—*Lancet*.

The Weather and Pneumonia.

The effects of various meteorological conditions upon the development of croupous pneumonia are discussed in considerable detail in Dr. P. J. Kolski's graduation thesis in the University of Moscow. He gives statistics of the disease and of the different meteorological conditions in Moscow for many years past, together with elaborate colored diagrams. He believes that though changes in the weather may not be the main cause of pneumonia, as they were at one time thought to be, still the modern tendency to ascribe everything to bacteria is to be resisted, for, according to his researches and observations, meteorological variations certainly play a not unimportant rôle in the etiology of the disease. Generally speaking, it may be said that abnormal weather is favorable to the development of pneumonia. The greatest number of cases has been found to occur in Moscow under the following conditions: A temperature lower than usual with very few diurnal variations, abnormally high barometric pressure, a north wind of less than its ordinary force and a small amount of rain or snow. Dr. Kolski does not agree with Seibert that pneumonia is especially rife when there is an absence of parallelism between the temperature curve and the curve of relative humidity, and he considers that the common opinion that strong winds are favorable to pneumonia has no foundation, for, as a matter of fact, the years when the winds have been high have been the very years during which there has been but little pneumonia.

The Digestibility of Tripe.

The *Lancet* has been challenged to pronounce an opinion on the dietetic virtues of tripe, an article of food which is largely consumed in certain parts of the country, especially during the winter months. Tripe consists of the soft muscular walls and mucous membrane of the stomach of ruminant animals with a small proportion of delicate omental fat adhering, from which, however, all fibrous portions of the serous covering, or peritoneum, have been removed. From frequent experiments it has been proved that tripe stands high in the list of albuminous substances that are quickly acted on by the gastric juice and reduced to a state of solution, and has therefore acquired a reputation for digestibility. But plain boiled tripe in itself is a very insipid article of food, and in order to make it palatable the art of the cook has to be invoked, which, while making it more "savory," causes it often when so served to be an offense to the stomach. The usual mode of serving tripe in this country is to boil it with milk and onions, and there can be little doubt that such a combination is not particularly digestible. Tripe is also sometimes fried in butter, but unless very carefully cooked it is apt to become leathery. If only plainly boiled in water it requires a considerable amount of condiments in the shape of salt, pepper and mustard to make it acceptable to the palate. Therefore tripe, as usually cooked, though an excellent dish for strong stomachs, is, owing to the ingredients added to it, not always so suitable for persons of weak digestion as has been supposed. One interesting point regarding the consumption of tripe is the local favor it receives in different parts of the country. It is a favorite dish among the artisans of the large towns in the midlands, while it is apparently disregarded in the south and west. A similar local partiality prevails in France, where Normandy has acquired a special repute for the dish *tripes à la Normandie*, which is served in many Parisian restaurants as a delicacy of no mean merit. London also consumes a large quantity, where during winter it is a favorite supper dish among the artisans and lower middle classes. The preparation of tripe, as far as London is concerned, is in the hands of only a few firms, who supply the small retail shops. London tripe, moreover, has obtained a high repute on the Continent, one firm exporting annually £40,000 worth, chiefly to Russia and Baltic ports.



**State Board of Health and Vital Statistics of the
Commonwealth of Pennsylvania.**

PRESIDENT,
HON. SAMUEL T. DAVIS, M.D., of Lancaster.
SECRETARY,
BENJAMIN LEE, M.D., of Philadelphia.
PEMBERTON DUDLEY, M.D., of Philadelphia.
J. F. EDWARDS, M.D., of Philadelphia.
GEORGE G. GROFF, M.D., of Lewisburg.
J. H. MCCLELLAND, M.D., of Pittsburg.
S. T. DAVIS, M.D., of Lancaster.
HOWARD MURPHY, C.E., of Philadelphia.
BENJAMIN LEE, M.D., of Philadelphia.
PLACE OF MEETING,
Supreme Court Room, State Capitol, Harrisburg, unless otherwise ordered.
TIME OF MEETING,
Second Thursday in May, July and November.

**Eighth Annual Report of the Secretary,
Benjamin Lee, M.D.**

CONTINUED FROM PAGE 194.

The following is the text of the order referred to :

TREASURY DEPARTMENT,
OFFICE SUPERVISING SURGEON-GENERAL, M. H. S.,
WASHINGTON, D. C., August 17, 1889.

To the Collectors of Customs, Medical Officers of the U. S. Marine Hospital Service, Agents of Foreign Steamship Lines, Local Quarantine Officers, and others whom it may concern :

The Act approved April 27, 1878, entitled " An Act to prevent the introduction of contagious or infectious diseases into the United States," provides that no vessel coming from any foreign port or country where any contagious or infectious disease exists, or any vessel or vehicle conveying persons, merchandise or animals affected with any contagious disease, shall enter any port of the United States, or pass the boundary lines between the United States and any foreign country, except in such manner as may be prescribed under said Act.

Furthermore, Section 4792 of the Revised Statutes of the United States provides as follows :

" The quarantine and other restraints established by the health laws of any State respecting any vessels arriving in or bound to any port or district thereof shall be duly observed by the officer of the customs revenue of the United States, by masters and crews of the several revenue cutters, . . .

and all such officers of the United States shall faithfully aid in the execution of such quarantine and health laws, . . . and as they shall be directed from time to time by the Secretary of the Treasury."

Official information having been received of an epidemic of cholera in Russia, and in view of the large immigration into the United States from said county, and of the danger that exists of the introduction of cholera into the United States through the medium of personal effects and baggage of said immigrants, it is hereby ordered that on and after September 18, 1892, no vessel having on board personal baggage, bedding, clothing, etc., belonging to immigrants from Russia, or having on board personal effects, baggage, etc., belonging to any immigrant coming from any cholera-infected district shall be admitted to entry into the United States unless accompanied by a certificate from the consular officer at the port of embarkation to the effect that said personal effects, baggage, etc., have been disinfected in accordance with the methods hereinafter described.

For the disinfection of said articles one or more of the following methods will be used, all articles to be unpacked and freely exposed for disinfection :

- (1) Boil in water not less than one hour.
- (2) Exposure to steam not less than one hour, the steam to be of a temperature not less than 100° C. (212° F.), nor greater than 115° C. (239° F.), and unmixed with air.

- (3) Solution of carbolic acid of a 2-per-cent. strength.

This method (No. 3) may be applied only to leather goods, such as trunks, satchels, boots, shoes; to rubber goods, etc., the articles to be saturated with the solution.

WALTER WYMAN,

Supervising Surgeon-General U. S. Marine Hospital Service.

Approved : G. L. SPAULDING, Acting Secretary.

The above action of the Secretary was taken in compliance with a request from the Secretary of the State Board of Health of Illinois. On the 29th of August a request was received from the same officer that the Board should co-operate with their own in memorializing the President to issue a proclamation suspending immigration until the cholera should subside. This your Secretary hesitated to do for two reasons : first, because he doubted the legal power of the President to take this step; secondly, because he felt that any such recommendation should take the regular course through the Marine Hospital Service, to which the duty of enforcing quarantine is assigned by law.

The following telegram was therefore sent :

DR. WALTER WYMAN, Supervising Surgeon-General of the United States Marine Hospital Service, Washington, D. C.

In view of the cholera situation the State Board of Health of Pennsylvania respectfully suggests that absolute prohibition of immigration from Europe during the present epidemic be enforced. If your department does not possess the power, this Board will second you in petitioning the President to do so, and, if necessary, to call Congress in extra session to authorize such action.

BENJAMIN LEE, Secretary.

To this the following reply was received :

WASHINGTON, D. C., Sept. 1, 1892.

DR. BENJAMIN LEE, Secretary of State Board of Health of Pennsylvania.

Circular issued to-day. Have State Board of Health to declare twenty days' quarantine on all immigrant vessels. See circular in press dispatches.

(Signed) WYMAN, Surgeon-General.

On August 30, the following circular was sent to the State printer, with instructions to print 10,000 copies with all possible haste, and also to print 10,000 additional copies of Circular No. 7.

COMMONWEALTH OF PENNSYLVANIA, STATE BOARD OF HEALTH.

Executive Office, 1532 Pine Street, Philadelphia, August 30, 1892.

To all Health Officers, Boards of Health and Borough Councils in the Commonwealth of Pennsylvania :

Early in the present summer the State Board of Health, anticipating the westward spread of Asiatic cholera, sent to every prominent daily paper in the State its circular, recently revised, on precautions against cholera and the choleraic diseases. In many instances these papers had sufficient intelligence and patriotism to publish considerable extracts from this circular, containing the most important points. In this way the information therein contained, as to the steps necessary to be taken by municipal authorities to prevent the disease from getting a foothold in their communities, has been widely disseminated, and it is trusted that your honorable bodies have felt the importance of acting in accordance with it. The apprehensions of the Board have, in the meantime, been amply realized. The National, State and Municipal Quarantine authorities, having put their respective stations in all possible readiness, are now momentarily expecting the arrival of cholera-infected vessels.

The President and Secretary of the National Conference of State Boards of Health, together with the Secretary of the American Public Health Association, are at present inspecting the stations of the Dominion government at the mouth of the St. Lawrence River, and should any deficiencies be found to exist in their equipment, they will doubtless be remedied at their suggestion.

The Secretary of this Board has within the past few weeks carefully inspected the stations at Boston and New York, the principal ports of entry for immigrants, and found them better equipped to meet such an emergency than ever before. He has also conferred personally with the Surgeon-General of the United States Marine Hospital Service, and with the Health Officer and the President of the Board of Health of Philadelphia with regard to the condition of the stations on the Delaware River and bay, and can assert that unusual and effective preparations have been made for the reception of infected vessels destined for ports on that stream.

It is your duty to supplement their vigilance by placing your towns in such a condition of cleanliness that should a few stray cases of the disease pass the coast cordons, its germs will find no congenial nests in which to develop. It is not enough that you should issue circulars conveying information to the public as to their duties, although this you should do frequently and fully. You should appoint special agents charged with the

duty of visiting every house and inspecting it from garret to cellar, from front door to back gate.

The enclosed blanks for a "Sanitary Survey" will show you what matters should be especially inquired into. You would be wise to have similar blanks struck off, or you can obtain them at moderate expense by applying to Prof. George G. Groff, Lewisburg, Pa. The results thus obtained will form a record of permanent value of the sanitary condition of your town, as they will indicate the places requiring at all times your special supervision. If you have not yet passed stringent regulations or ordinances with regard to cess-pools, drains, pig-pens, slaughter-houses, gutters and other similar nuisances, you should do so at once. A copy of the "Model Ordinance" is enclosed as a guide for this purpose. All public supplies of drinking water should be carefully investigated and, so far as possible, in view of the unfortunate refusal of the legislature to pass a law protecting them, guarded from pollution. Suspected wells should be analyzed.

The limited means at the disposal of this Board will not permit it to offer analyses free of expense, but it has made arrangements to have them made at reduced rates. All wells situated within 200 feet of an uncemented cess-vault, or liable to receive surface drainage from privies, barn-yards, pig-pens, chicken-yards, or house-drains, should be regarded with suspicion, and in the event of the presence of cholera in your town their use should be absolutely forbidden. Under the same circumstances nothing should be allowed to enter the mouth which has not been cooked, whether meat, vegetables, fruit, milk, or water. It is unnecessary to repeat in detail the precautions which will be found in the accompanying circular, all of which are of importance. You have ample time for preparations, which will make your constituents, who look to you for protection, feel comparatively safe, and thus avert a panic should the disease make its appearance.

By order of the Board,

BENJAMIN LEE, M.D.,
Secretary and Executive Officer.

On the third day of September the board met in extra session to consider the situation and adopt additional precautions. It was ordered that pending the printing of the circular to health and municipal authorities, it should be given as wide a circulation as possible through the public press.

The following orders and regulations were adopted :

QUARANTINE OF PORTS OF ENTRY.

In accordance with the proclamation of the President of the United States, and in compliance with the request of the Surgeon-General of the United States Marine Hospital in charge of the National System of Quarantine, the State Board of Health of Pennsylvania hereby orders that in view of the fact that Asiatic cholera prevails in many ports and States of Europe, including Great Britain, no vessel from any cholera-infected port shall be permitted to enter at any port in this State until such vessel shall have undergone a quarantine detention of twenty days.

It is further ordered that no vessel as hereinbefore described shall be permitted to enter the waters of the Delaware River above the line dividing the State of Pennsylvania from the State of Delaware, without having been previously inspected by the officer in charge of the United States Marine

Hospital Station near the town of Lewes, in the State of Delaware, it being understood that such order is co-operative with and not in contravention of the orders of the Board of Health of the city of Philadelphia.

It is further ordered that no boat, tug, skiff or any other conveyance shall be permitted to land on the shores of any rivers or lake, or at any wharf or dock on the same from any such vessel, or to go from said shores to any such vessel, save and except those which are employed or authorized by legally constituted quarantine authorities.

All police officers and constables in townships bordering on waters into which such vessels may come are hereby enjoined to keep vigilant watch to prevent any such intercommunication.

This order shall take effect at once.

TO TRANSPORTATION COMPANIES.

In accordance with Regulation III of this board, which reads as follows :
REGULATION IN REGARD TO THE SANITARY SUPERVISION OF TRAVEL
AND TRAFFIC.

Upon satisfactory information of the approach to or the transit through the Commonwealth of Pennsylvania of infected persons or goods it shall be the duty of the Secretary, as executive officer of the board, to cause the same to be stopped at the State line, or if found within the limits of the State, to cause such persons or goods to be removed from cars, stages, vessels, boats, or other conveyance, and securely isolated and disinfected; and he may, if in his judgment the emergency is such as to demand it, call a meeting of the Committee on Travel and Traffic, to which his action shall be submitted with his reasons therefor in writing. But in cases coming under the jurisdiction of national or municipal authorities, he shall co-operate with said authorities in all such action.

Notice is hereby given to the officers of all transportation companies, whether by land or by water, that any transportation company shall be declared contraband of quarantine which shall introduce, land or transport within the borders of the Commonwealth of Pennsylvania any person suffering from Asiatic cholera or cholera (so-called), or any person who shall develop said disease within four full days after having been so introduced, transported or landed within the borders of said Commonwealth by such company.

If a railroad company be thus declared contraband of quarantine its trains shall be stopped at the State line, and held until inspected by an inspector of this board and declared by him free from the danger of conveying the contagion of Asiatic cholera into this Commonwealth.

If a steamboat, canal, or other navigation company, its boats shall not be allowed to enter any dock, tie up at any wharf, or by any means land passengers, baggage or merchandise until it has undergone like inspection, and been declared free from danger of introducing the said contagion into the Commonwealth of Pennsylvania.

To the officers of railroad and steamboat companies in Pennsylvania :

The principal railroad companies operating in this State have adopted admirable regulations for the sanitary care of their cars and premises under ordinary conditions. The State Board of Health has already taken occasion to commend these, as well as the readiness of these companies to

co-operate with it in efforts to protect the public health. In view, however, of the threatened invasion of Asiatic cholera, it is important to enforce these regulations with unusual strictness, and to take certain additional precautions.

The board, therefore, orders :

First.—That all water-closets and urinals in cars be provided with proper water-tight receptacles for retaining deposits instead of allowing them to fall on the tracks, and thus endanger water supplies ; said receptacles to contain disinfectants, and to be renewed at certain intervals in such places and in such manner as may be determined upon for the most perfect protection against infection. The adoption of the precaution should be begun with second-class and immigrant cars, and extended as rapidly as possible to first-class cars.

Second.—Should the discharges of the sick fall upon seats, floors or platforms of cars or stations, they should be first disinfected and then removed in closed buckets, and the soiled places then disinfected and thoroughly cleaned.

Third.—All cars coming from infected places shall be disinfected before sweeping, and the sweepings disinfected and burned.

Fourth.—All water-closets and urinals in steam boats and canal boats shall be provided with proper water-tight receptacles for retaining deposits, instead of allowing them to fall into the water, which is in most instances the supply of drinking water for some centre of population. Such receptacles shall always contain disinfectants, and shall be emptied at the end of each trip in such manner and in such place as may be designated by the local authorities.

Fifth.—All accumulations of filthy clothing and rags shall be at once disinfected and burned.

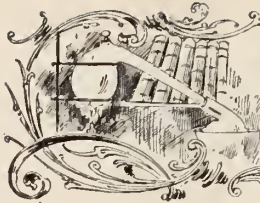
Sixth.—Should cholera become epidemic, the drinking water furnished for the use of passengers should be boiled, and so far as possible should not be obtained from places in which the disease exists.

At the same meeting the following resolution was passed :

Resolved, That the Secretary be instructed to represent to His Excellency, the Governor of the State, the danger now threatening our population from cholera, the inability of the board to appoint paid agents who may be necessary for purposes of railroad inspection and other precautionary measures, and to inquire of him whether any portion of the moneys in the State treasury can be drawn upon to meet these exigencies.

At the same meeting the Secretary was instructed, on the appearance of cholera in any portion of the State not protected by sanitary authorities, to confer with the county authorities in regard to the furnishing of hospital accommodations and medical and nursing care, and to make application to the Adjutant-General of the State for a sufficient number of tents for hospital purposes.

[TO BE CONTINUED,]



SANITARY APPLIANCES AND MEDICINAL PREPARATIONS

This department is designed for the description of improved Sanitary Appliances and Medicinal Preparations introduced by patrons of The Annals. The matter is not paid for, nor can it be classed as advertising. But as the information is necessarily obtained from those who offer the appliances for sale, it is proper to say that the manufacturers, rather than ourselves, are responsible for the statements made.

Kresin.

THE remarkable advance made in sanitary science during the past twenty years has not only greatly added to the protection and lengthening of human life, but has also benefited to a very great extent our friends the dumb animals.

Men are beginning to find out that it pays to keep barns clean and wholesome, and that science is able to assist in exterminating disease germs in the stable as well as in the house. Manure is no longer kept in barn cellars, as it used to be, until the spring, but is promptly carted out and spread upon the land, where it belongs. The barn cellar should be just as sweet and clean as the house cellar, and disinfectants should be freely used.

The new disinfectant, "kresin," is especially convenient for use in barns and stables. Solutions can be readily and accurately made by an ordinary farm hand. Kresin requires certain conditions to make its operation as a valuable disinfectant operative. In the first place the barn should be thoroughly cleansed out; refuse matter of all kinds should be entirely removed. This applies to the cellars as well as to the barn proper, and the liberal use of it is recommended in the cellar and upon the floors of the barn.

A tablespoonful of kresin to each quart or two of water, in making a whitewash, is desirable, and the kresin should be added when the whitewash is cool. Newly-bought cattle, as well as the cattle already in the stable, should be washed with a solution containing a tablespoonful of kresin to three quarts of water. The sinks, troughs and stalls of the animals should be continually disinfected with the same solution. Where any eruption has appeared upon animals they should be washed thoroughly with this solution.

A liberal use of kresin during the season when flies and insects annoy the cattle will be well worth the time and expense it costs. For ulcer, cancer or injury of the hoof, thrush off the frog-corns, saddlecracks and fissures, inflammations of the knee, founder, saddle or harness sores in horses, daily washing, painting and cataplasms with a solution of kresin—tablespoonful to a quart of water—is to be recommended. In mouth and hoof diseases, herpes, apthæ, ringworm, scratches and fever, kresin is the best application for their treatment.

These solutions will be more efficacious if made with warm or hot water. In sponging down the legs of horses, after they have come in from a drive, it is well to add a tablespoonful to two quarts of water.

Kresin should always be used in solution, and never undiluted. The old idea, now happily exploded, that any soap is good enough for the stable, should not be tolerated. Kresin soap, which is a valuable disinfectant, deodorizer and antiseptic, should always be used in the stable, when soap is required. At least once a week the udders of cows should be washed with a solution of kresin, one tablespoonful to three quarts of water. A week after its birth the calf ought to be washed with the same solution, and the external genitals, thighs and legs of the mother require the same attention.

In the care of the outbuildings of the farm, particularly the hen-houses and the hog-pens, kresin should be liberally used. The hen roosts and nests should receive a stronger solution. Dip each fowl in a solution containing one tablespoonful of kresin to a quart of water, as a preventive against lice. For the care of dogs kresin is especially useful as a preventive against mange, scab, itch and eczema. A bath containing one tablespoonful in each quart of water will be found of great benefit in the care of dogs.

Kresin will be found to be the most convenient and valuable disinfectant for veterinary, agricultural and domestic purposes. It destroys the germs of contagious diseases and is a most powerful deodorizer. It destroys dry rot, fungi and mold in and about buildings, and is a protection generally, as well as a preservative.

For those who are obliged to be around and about cattle, the use of kresin soap will tend to destroy the odors and act as a powerful antiseptic.—*Report of William Thornton Parker, M.D., Member of Massachusetts Medical Society.*

Further information from Schering and Glatz, 55 Maiden Lane, New York.

The Clinical Uses of Papoid.

PAPOID is the active principle of the juice of the trunk and fruit of the Carica Papaya, or South American Melon Tree. Its digestive power is almost incredible, softening muscular tissue in twenty minutes, and digesting 2000 times its own weight of moistened fibrin in a very short time. Living membranes are not affected by it. As much as seventy-five grains have been administered to dogs and rabbits without any untoward results (Herschell). It acts in either acid, alkaline or neutral solutions, and its affinity for fibrin is so great that being placed in contact with it, no amount of washing will remove or stop its action. This being the case, the natural inference arises that papoid is an agent which would be most useful in the treatment of diphtheria, membranous croup, or in that of any condition in which there is deposition of false membrane.

There are many members of the profession who, after years of trial, have almost lost faith in the pepsins, and especially is this true in those cases of so-called atonic dyspepsia, in which pepsin has been relied on and found wanting, and there are thousands of such cases which daily present themselves to physicians for treatment. Frequently the statement is made: "Doctor, I have taken all sorts of pepsin and without relief;" but the doctor says: "Here is a new preparation of pepsin which I am sure will benefit you." The patient takes his prescription, and later on takes his pepsin; he soon returns with the same old story; his digestion is no better, and he is

feeling worse, if possible, than before. It is this result which, as I said previously, has caused a large number of the thinking members of our profession to lose faith in pepsin, and they only continue to prescribe it in a routine sort of way, largely from habit, but more especially because they have been unable to find anything better. To such I say try papoid, and you will not be disappointed. Herschell and Woodbury have pointed out that papoid has greater digestive power than either pepsin or pancreatin, and can be used when pepsin is contraindicated or powerless. Experience has proved this to be true, and it may be stated, without the fear of contradiction, that papoid under the conditions indicating the use of animal pepsin will produce *some* results, while animal pepsin under the conditions indicating the use of animal pepsin will produce no results whatever. It may be further stated that *papoid under papoid conditions produces greater results than animal pepsin under pepsin conditions!* Papoid is indicated in any case where there is a deficiency of the gastric juice, no matter from what cause; in gastric catarrh, acute or chronic; in cases of anemia and general debility, productive of deficient blood supply; in chronic alcoholism, which is always accompanied by an excess of unhealthy mucus in the alimentary canal; in the vomiting of pregnancy, and all irritable conditions of the stomach associated with pain and vomiting. In duodenal and intestinal indigestion papoid is infinitely superior to pancreatin. These are no imaginary statements, but are based upon absolute results from practical experience, and from records that cover both negative and positive results.

Further information from Johnson & Johnson, Cor. William and Platt Streets, New York.

Glycozone.

GLYCOZONE is a stable compound resulting from the chemical reaction which takes place when C. P. glycerine is submitted under special conditions, to the action of fifteen times its own volume of ozone, under normal atmospheric pressure at a temperature of 0° C.

The presence of water (and other foreign substances) in the glycerine, changes the nature of this reaction, so that instead of producing glycozone we obtain formic acid, glyceric acid and other secondary products having deleterious effects upon the animal cells.

Although glycozone absorbs water readily, it does not deteriorate when kept at a temperature of 110° F. as long as it retains its proper anhydrous condition.

Glycozone acts as a stimulant to healthy granulations. Its healing action upon diseased mucous membrane is powerful and harmless in the treatment of inflammatory diseases of the stomach. In such cases it gives immediate relief to the patient.

General Directions for Use.—Glycozone may be given for diseases of the stomach in doses of one to two teaspoonsful in a wine glassful of water immediately after each meal. In catarrhal diseases it should be applied in full strength as often as required. As an application to wounds and suppurating surfaces it should be used without dilution.

Further information from the Drevet Manufacturing Company, 28 Prince Street, New York.

THE ANNALS OF HYGIENE

PHILADELPHIA
VOL. VIII NO. 5

COMMUNICATIONS.

Sanitary Administration of New York City.

BY CYRUS EDSON, M.D.,
Sanitary Superintendent, Board of Health, New York City.



THE health interests of the city of New York are in charge of the Board of Health, and the system which is followed is the outcome of many years of experience in dealing with problems as perplexing and insistent as are those presented to any health authorities in the world. Probably in no city, where the care of the public health is looked on as a proper function of the municipal government, are there as many factors to be considered. Being the principal port of entry in the country, New York not only receives the largest number of imports, but she has to handle the greatest share of immigration. The shape of the city, an acute-angled triangle, and the small acreage of land, combined with the impossibility of spreading, except in one direction, produces great congestion of population. This shape, too, is responsible for the high tenement houses, and although, under a wise city ordinance, not more than 60 per cent. of any city lot can be occupied with a dwelling house or any structure, the height of the houses seriously diminishes the possible ventilation. There are, therefore, conditions affecting the public health in the city of New York which are not found elsewhere. These make the problems presented peculiarly difficult of solution. At the same time they have had the effect of developing a system under which the health authorities work, which is, perhaps, the most perfect known

to-day. In fact, no less perfect a system would at all avail. It is the result of the most earnest study by many men of brains, and it has been elaborated after many trials and not a few failures.

The Board of Health consists of a president and three members, two of which are *ex officio*. The president, who must not be a physician, and the commissioner of health, who must, are appointed by the mayor of the city. Joined to these are the president of the Police Department and the health officer of the port. The board, then, consists of two physicians, the commissioner and the health officer, and two laymen, the president and the presiding officer of the Board of Police. The board has a secretary appointed by itself. The members of the board at present are: Charles G. Wilson, president of the Consolidated Exchange, president; Dr. Joseph B. Bryant, medical commissioner; James Martin, president of the Board of Police; Dr. W. T. Jenkins, health officer of the port; and General Emmons Clarke, secretary.

The work of the board is carried on by two bureaus, the Sanitary Bureau and the Bureau of Records. Taking the latter first, it is the duty of Dr. John T. Nagle, the register, to see that all vital statistics of the city are properly kept on file, permits for burials issued and the state of the public health calculated.

The Sanitary Bureau, of which I am superintendent, is what might be called the executive arm of the board. It is my duty to see that the orders of the board are carried out. These may vary from the abatement of a nuisance to the handling and suppression of an epidemic of contagious disease. The bureau is divided into three divisions: the Sanitary, under Major Willard Bullard as chief inspector; the Division of Contagious Diseases, Dr. Charles F. Roberts, chief inspector; and the Division of Bacteriology and Disinfection, under Dr. H. M. Biggs.

The board has the Willard Parker Hospital, in the city, and the Hospitals for Contagious Diseases on North Brothers' Island, under its control.

The work of the first and third divisions of the Sanitary Bureau need not be dwelt on at length, as the names are sufficient. When complaints of nuisances dangerous to the public health are received, they are investigated and the nuisance abated. For this purpose the law gives the Board of Health almost unlimited power.

It is in the work of the second division of the Sanitary

Bureau, that of Contagious Diseases, that the public rightly feel the greatest interest. It is on this division that the management of any outbreak of disease falls, and it is owing to the efforts put forth by it that the death rate from the so-called preventable diseases in New York is small. Smallpox, scarlet fever, measles, typhus fever and diphtheria break out in New York almost every year, yet the number of cases is not large. This is owing solely to the system in operation in the Division of Contagious Diseases, and the faithful and skillful manner in which that system is applied. The history of the outbreak of cholera in New York in September, 1892, is enough to alone prove the perfection of that system. With eight centres of infection there was not a single secondary case. This record, so far as I know, has never been paralleled.

The system of which I speak is, like the majority of perfect things in this world, exceedingly simple. It turns wholly on the treatment of the individual. The officials of the Board of Health in this city have been taught by bitter experience that the only way in which contagious disease may be fought is to follow every case of it, and to watch every single person who has been exposed to contagion. In view of the fact that in a crowded city a patient may meet many people before the health authorities get hold of him, this would seem to be an immense and distressingly difficult plan to carry out. It is all this, and more, sometimes, yet it is beyond question the only plan on which any dependence may be placed. In order that the work may be understood, I will follow up in detail an imaginary case.

We will suppose that a man walks into a drug store and tells the proprietor he is sick. From some cause or another the proprietor notifies the Health Board, and a medical inspector drives in an ambulance to the store. There he finds the patient evidently very ill, and he diagnoses the disease as typhus. The patient is at once taken to the reception hospital, and from thence is sent to North Brothers' Island. But before that the medical inspector gets from him his name and, if possible, where he has been for the previous week. It may be that he slept the night before in some police station, or in one of the cheap lodging houses of which portions of New York are full. Then the hunt begins.

The name of every person with whom the patient came in contact is secured, and, when possible, each person is got hold of. With those of the class that frequent cheap lodging houses the

Board takes no chances; they are forced to wash thoroughly, their clothes are disinfected, and they are locked up and watched for the full period of the incubation of the disease. The lodging house or police station is disinfected in the most thorough way. While the keeper of the house or the policemen at the station are not locked up, they are placed under surveillance, and twice a day during the period of incubation a medical inspector visits them. The other men of the class to which the patient belongs who know him are carefully interrogated as to his movements during three weeks before he was found ill, and all persons said to have been in his company are watched until the period of incubation dating from their exposure has terminated. It may be seen at once that this process is something akin to the ever-widening circles in the pond when a stone is thrown in, but the board has found no other system or plan that can be depended on. The labor involved is immense, but the result is safety.

In the case I have taken, the most difficult of all has been illustrated. When the disease—typhus again—breaks out in a house and a member of a family is stricken, the system is the same, but the difficulty is not so great. And for this reason—when a man, living with his wife and children, develops the disease, it is much easier to find out who he has been in contact with during the preceding three weeks. His wife or his neighbors will know of his movements. When the “suspects,” as we call those who have been exposed to contagion, have “local habitations” it is not the custom to lock them up. The medical inspector can always find them and make his visits twice a day.

The key-note of the New York method of stamping out contagious disease is preventing its spread, and to this end all the appliances known are employed. The ambulances in which patients are carried are rubber lined, and are disinfected as soon as the patient is taken out. Every effort is directed toward preventing the germs of the disease reaching those who are well. Of the actual treatment of the various diseases I shall say nothing here, as these are familiar to all physicians, and in New York differ in no wise. But there is more to say of the prevention of the spread of the disease.

When it is necessary to treat a patient outside a hospital, the room occupied by the patient is quarantined. All vessels, cloths or other things that have been used about the sick are placed in proper receptacles—for example, wash-tubs—and there covered

with the solution of bichloride of mercury, 1 to 1000 parts of water, in which they remain for half an hour. All discharges are flooded with this solution before being poured into the waste sinks, and these are disinfected with the solution at frequent intervals. Care is taken to see that the nurses do not come in contact with others. The house itself is quarantined, and, if extreme measures be necessary, a policeman on guard prevents persons leaving it. Food is supplied without contact between those delivering and those receiving it. All garbage, rags, waste, etc., is burned in the kitchen stove. When the patient is either dead or convalescent these precautions are maintained until the full period of the incubation of the disease is at an end. The house is thoroughly disinfected. Sulphur—three pounds to every 1000 cubic feet of air space—is burned in all the rooms, the floors are scrubbed and the walls and ceilings washed down with the bichloride solution. All the clothing, blankets, curtains and other woolen fabrics are taken to the disinfecting station, where they are opened out and exposed to moist and to dry heat at 200° for two hours. All fabrics that may be washed are put through the bichloride solution. The clothes worn by the inmates are disinfected and the inmates themselves are required to wash thoroughly in the bichloride solution before they rejoin their fellow-men, and, finally, the house is thoroughly aired.

I have written to little purpose if it is not now evident that such a system as this not only cares for the sick, but, when carried out as it is in New York, absolutely prevents the germs of disease reaching those who are well. Of course, it is not applied in all of its severity to all contagious diseases; the force of employees of the Board would have to be trebled if it were. We do not follow up a case of measles after this fashion, nor do we use such extreme measures in cases of scarlet fever. But each case of scarlet fever, measles or diphtheria must be efficiently isolated, and all unnecessary exposure to others prevented. To enforce this a medical sanitary inspector visits the case as soon as it is reported and leaves directions, verbal and written, for the sanitary management of the premises and of the sick person. He visits the case later on at frequent intervals, and if his directions are not observed, and the persons in charge are wilfully doing anything to spread the disease, he reports to his superior, who may order the removal of the sick person to the department hospital.

If on his first visit he finds that, owing to the construction of the patient's habitation, proper isolation cannot be carried out, he reports the fact to his chief, who causes an inspection to be made by another inspector and bases his action on the joint report of both. If the two inspectors disagree, then the chief inspector visits the case himself and decides personally what is best to be done in the premises.

But this is the system which enables us in New York to stamp out typhus and to defy cholera, and with this system there is no contagious disease that I know of which the New York Board of Health is afraid. This system will give absolute protection to any city. True, it needs a force of devoted and experienced men; men who reckon no danger too great to face in the line of their duty, and men who are willing to give the infinite attention to detail which the system demands. Of such men the New York Board of Health has a force, and of them it is rightly proud.

There is a part of the work of the sanitary division which demands a few words. It is a work made necessary by the peculiar conditions existing in the tenement houses of the city. A force of men is kept constantly at work visiting these places and examining the ventilation, the plumbing, the cleanliness—the lack of it would be more correct—and such other things as may need inspection. Such changes as they deem necessary are reported by these inspectors, and the Board has power to order the remedy and to enforce the obedience of these orders. The visits of these inspectors may take place at any time, and are generally unexpected by the owners of the houses. The lodging houses, from the character of their occupants, and the very nature of the business, speedily get into the most filthy condition. Were they not carefully watched they would become hot-beds of disease. As in the methods taken to prevent a spread of contagious disease; so in this inspection of the lodging houses, the New York Board of Health acts on the principle that “an ounce of prevention is worth a pound of cure.” In fact, were the Board to select a motto, this old proverb would, of all sayings, be the most appropriate.

It is a part of the duty of the sanitary inspectors, too, to examine the back yards and cellars, the alley ways and the foot of air-shafts in the poorer part of the city. They keep an eye on all heaps of rubbish of any kind, and they see to it that liberal supplies of disinfectants are used. This work is peculiarly onerous in the spring, when the waste, collected during the winter, is apt to decay under the influence of the warmer days.

The third division, that of bacteriology and disinfection, is under the charge of Dr. Herman M. Biggs. Its work is outlined in its name.

An important part of the work of the New York Board of Health is found in the public schools. Not only are the buildings themselves inspected carefully in order to see that the rules of the Department of Public Schools are carried out properly, but the utmost attention is given to the children. No child who has suffered from a contagious disease, and no child from a house in which contagious disease has appeared, can go to school without a permit from the Board. These permits are given only when the officials having them in charge are convinced the danger has passed. When smallpox breaks out, every child in the school and in the neighborhood of the case is promptly vaccinated. All children are required to have a certificate of successful vaccination before they can be admitted to the public schools.

An important part of the work of the Board relates to the Croton Water Shed. Inspectors are almost constantly at work there, watching out for nuisances which will contaminate the water supply. Nor is this all. Every week the chemist of the Board, Mr. E. W. Martin, makes analyses of the water in order to see that it is wholesome and fit to drink. At the least sign of anything dangerous the fact is reported to the Department of Public Works, which has the water supply system in charge. The importance of good water is too well understood not to insure the most ceaseless vigilance being exercised.

The work of the New York Board of Health, as I have briefly outlined it, may be summed up in one word. "Prevention." The city is watched in the most careful way, and every possible method is employed to get hold of contagious disease at once. More than this, should the Bureau of Vital Statistics report that an unusual number of deaths have occurred from any non-contagious disease in any section, steps are taken instantly to find out why, and to abate the cause, if possible. It is owing to work of this kind that the death-rate in New York is so low, in spite of the many reasons existing why it should be high. The work done under the orders of the Board and the system followed, are eternally and everlastingly aimed at the prevention of the spread of disease. So far as it is humanly possible, the New York City Board of Health treats contagious disease by having no disease to treat.

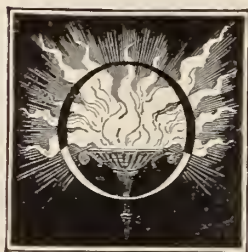
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Care of the Voice.¹

THE MAINTENANCE OF NERVE FORCE AS A FACTOR IN THE SUCCESSFUL USE OF THE VOICE.

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FTEN do we find that another's words have expressed for us what we have been vainly endeavoring to say, and so to give my thoughts definiteness of direction I quote to you words from Lowell's "Finding of the Lyre:"

There lay upon the ocean's shore,
What once a tortoise served to cover,
A year or more, with rush and roar,
The surf had rolled it over.

So there it lay, through wet and dry,
As empty as the last new sonnet,
Till by and by came Mercury,
And having gazed upon it,
"Why, here," cried he, "the thing of things,
In shape, materials and dimension;
Give it but strings, and lo, it sings!
A wonderful invention."

So said, so done: the chords he strained,
And his fingers o'er them hovered,
The shell disdained a soul has gained,
The lyre had been discovered.
O empty world that round us lies,
Dead shell, of soul and thought forsaken,
Brought we but eyes like Mercury's,
In thee what songs should waken.

Thus in the old-time myth, born in the world's early morning, when untrammelled the hearts of men responded to the soul of Nature around them, we have Hermes, the god-born son of Zeus and Maia, climbing from his cradle in a cave of the great Eyllenian Hill, wandering along the shore of the loud-resounding sea, and creating, through his heaven-born gift, divine music with the reeds and cords strung over his soulless couch, making it the spirit and vehicle of all future song. Breathing softly as

¹ An address delivered before the Toronto Conservatory of Music.

the babe in its cradle, his breath is the summer zephyr murmuring sweet lullabies to the nodding reeds along the seashore, or, bursting into anger, it sways the mighty fir-trees on the Thessalian hills, and tears down gnarled oaks in its resistless course.

Such is the fabled god of all music, born of the mighty Jupiter, father of the gods, and having a mother nymph, Maia, the soul of that mysterious music which is the sea :

The water lapping on the crag.

Search where we will, study as we may, we have at last to admit that first and above all else, music approaches the divine in that it is the expression of that infinite harmony which nowhere on earth has ever existed, but which is approached in the degree that every sense and faculty attains its highest development of function. There are functions with every shade of difference from that between the perfectly deaf and the miraculous acuteness seen in those deprived of another sense—as, for instance, Blind Tom. The different nerves, more or less perfectly, bear external sensations to the cerebral centres, resulting in conceptions and ideas which appear again in outward acts—as in the movements of the limbs or of the organs of voice.

Hence everyone will, I trust, at once recognize the point that I have been endeavoring to make plain, viz., that the ideally perfect doer of any act, whether it be wrestling or singing, will be he who, with the most perfect hereditary or innate faculties of mind and body, shall from birth onward continue to have every function of mind and body and spirit developed in that degree which shall secure a harmony of being which shall be unconscious as the music of the spheres, and which among men has been perfect only—

When the morning stars sang together,
And all the sons of God shouted for joy.

Having thus, then, indicated the ideal to which, with the gifts, mental and physical, which have been given us, we shall strive to attain, it becomes our duty to inquire into the various influences making for or against the attainment of this ideal. It may be that what I shall say may not at once be fully apprehended, but I trust that to many some useful facts may be brought which shall aid them in the work in which they are engaged.

You have doubtless been accustomed to think of voice as being the outcome of the air being forced as by a bellows of

various volume through a narrow slit composed of two tendinous bands of tissue, receiving certain modifications through the action of other organs, as the muscles of the palate, the tongue and the lips. Doubtless in a general way this is true, and yet I have met with persons having all these organs and yet who could do nothing more than say yes or no (whispered). Many of you have experienced the same thing. Now, I have no doubt but that you will ascribe this to their having had a cold. In most cases this is correct, but very few of you have thought of all that is involved in a cold. Returning to our case of the two bands and the bellows, you will recognize that one or both elements in the problem may be lacking; either the bellows may have a very small volume and power, or, what is more common, the two bands may be swollen so as in large measure to close up the aperture; or they may remain relaxed and loose with the air passing through them as through an unstrung Æolian harp. Both conditions may, however, exist together. "Ah," but you say, "these are conditions of disease, and do not enter into the question of voice in the healing." Let us further examine into the question. Take the case of the swollen vocal cords. What does this indicate? Not only that the cords are swollen with an increased amount of blood in them, but further than this, pressure of blood very greatly lessens their elasticity. Further observation shows us that if this attack of inflammation has subsided, the bloodvessels, notably the veins of the mucous lining of the larynx, remain still more relaxed, with an increased secretion of mucus, resulting in huskiness and loss of tone. Such are the local effects of catching cold, but should cold-catching be repeated we find that after each successive cold the parts remain still more relaxed, and their return to health is slower. These repeated congestions finally end in a permanent thickening or overgrowth of the vocal cords, and, in general terms, it may be said the voice is permanently injured.

It now becomes of interest to inquire wherein lies this tendency to repeated colds or congestion, which in the experience of many is so common. Stated in the most general way it means that loss of nerve force has taken place. What we have already referred to means local loss of nerve tone in the larynx, followed by its extension to the pharynx and chest. Let this extend, and loss becomes general for the whole body. When we speak of causes it will become equally evident that this order may be

reversed, and that general loss of nerve tone may precede or be contemporaneous with the loss of local nerve force. I must now speak a little more exactly of what is involved in the loss of nerve power. I shall be brief, and trust that I may be followed.

Our bodies, like the bodies of all plants and animals, are built up of simple compounds, the difference between the simplest microscopic being and man being due to the power Nature has implanted in man of great development or differentiation of parts. Skin, muscle, bloodvessels, brain, etc., are all gradually evolved from the simplest form, and like the various parts of a tree are indissolubly bound together to act and react upon one another. Those who have followed me will further see that any human organism is like a plant, in that it has two invariably present influences affecting it; first, those inherent to it, that is, which are inherited, and second, those due to its environment. All will appreciate how much this means when I say that it is in men that the nervous system is most highly developed; and since of all tissues this is the last to be fully differentiated, we must expect that, as the nerve functions of the body are the highest and have a governing influence over every other tissue, so in like manner they are the first to be affected by any malign or benign influence. This has been neatly expressed by a recent writer:

“Every individual system of the body is controlled by the nervous system; by it most subtle changes in capillary blood-pressure may be brought about, and the amount of capillary blood-pressure doubtless influences the circulation of the plasma environing the cells; the nervous system again exerts a most potent influence over secretion, excretion, the production of heat, and many other processes which it is needless to enumerate. When we reflect, indeed, that every active cell in the body, such for instance as the gland and muscle cell, is supplied with a nerve filament, it becomes at once evident what a dominant influence the nervous system wields over the rest of the body.”

If this language seems too technical I shall endeavor to express the same truth in more general terms. All recognize the existence of the special senses. You will tell me that sound waves with differing vibrations impinge upon a sensitive conducting medium, and that, being borne along by molecular vibrations in the auditory nerve, the conception of sound and harmony is obtained. Similarly with waves of light impinging upon the retina and conducted by the optic nerve to the brain,

we see objects. Let there be an external obstructing medium, or an internal interruption to the current in the nerve, and defective hearing or sight is the result. Now let us reverse the order. Let us take the case where the nerve centres of the brain have received certain impressions which, associated, go to form ideas, and which by an effort of the will find expression by setting in motion along the nerves molecular movements extending, let us suppose, to the muscles of the larynx. Now, on the definiteness of the idea to be expressed, on the power of the will to set in motion, and of the nerve to conduct the message sent along it, will depend the quality and tone of the voice—always provided that the larynx is in a normal condition. Now, I hope that in this brief, if somewhat technical statement, of a sequence of physiological phenomena, I have been closely followed; for if this be grasped there will be no difficulty in following the amplification of this statement in the following illustration: All are aware that in a certain form of disease of the cranial nerves, loss of voice through paralysis of the vocal cords takes place—along with the muscles of the tongue and pharynx—it being known from the parts affected as glosso-laryngeal paralysis. Among the causes are cold, excessive use of the voice, etc.

But we sometimes have what we call functional loss of voice, without actual paralysis of the organs of the voice; and it is to this class that a special interest belongs. I cannot illustrate it better than by giving a case which came under my observation a number of years ago.

A lady came to see me who had for several months previous been suffering from a loss of voice more or less complete. She had been prescribed for by several physicians; one believed it to be due to a true paralysis of the organs of the voice; the others to an excessive use of the voice in teaching. So one prescribed using the voice to regain its flexibility, and the other advised rest in order that it might regain its tone. Slight observation and conversation with her sister was sufficient to convince me that she was in a condition of generally reduced health, owing to a severe cold caught in the early winter, and never recovered from as to its general effects. I was, of course, anxious to discover whether the voice reduced to a whisper was due only to a loss of tone or to some more serious cause. I examined the larynx at first tentatively with the laryngoscope, in the usual way asking her to say, "ah!" She responded, "ah!" in a whisper. I noticed while

using the instrument in the throat that the latter was unusually insensitive to touch. I again asked her to direct her eyes to the reflector of the mirror, saying, "A little louder, please!" She responded in a half voice. I tried a third time, repeating the request. The result was a voice, "ah!" in a full tone. I then remarked, what was evident to herself, that the voice was not permanently lost—indeed, that no paralysis existed except what was due to loss of tone of the system. But how was her voice brought back? She had been ill; had caught a cold. Local swelling and temporary loss of voice resulted. But the acute inflammation with congestion had subsided, leaving the local mucous membrane relaxed, while the general loss of tone prevented the nerves from efficiently conducting a volitional act of the brain, which itself was defective in function. No doubt exists that the last phenomenon came last in order, resulting from the continued local congestion and loss of effective voice sufficient to induce a mental impression that there was no use in exerting the power to will to speak. Following the steps taken to overcome this defect of will we see that I first directed the attention to what I was engaged in—the examination of the throat. Next came the calling into activity the will power—temporarily in abeyance—by asking her to speak a little louder. The temporary excitement caused by the examination with an instrument in the back of the throat stimulated mental operations. The efferent nerves carrying the cerebral impulse, exerted by will at my request, to the larynx, for the moment unimpeded by any preconceived idea of powerlessness, supplied a sufficient stimulus to the muscles of the larynx to cause their contraction. The sound of her own voice was enough to persuade her that she had this power, and the stimulus of hope and a prospect of recovery followed—the local nerve tone for the time under excitement being restored.

I think no better example than this could be given of the loss of nerve force and of the results attending it. While, as we have seen, there was local derangement through congestion of the organs, there was likewise a general loss of tone, showing itself in an insufficient nutrition through the healthy blood of the cells of the brain; hence the mental depression and loss of will power. Remembering that such a state is but a local index of constitutional derangement, we can see how appetite, digestion, and all that depends upon them would require the most careful attention

in order to overcome gradually a condition productive of incapacity for the proper performance of the every-day and special duties of life.

But I need not further refer to this instance of neurasthenia, or nerve weakness. I doubt not but that some of you are in your own persons, or in those of friends, familiar with examples of nerve prostration. How often do we hear it said of singers, or by singers on this or that occasion, that they were nervous. Notably is this true of many undergoing the trying ordeal of solo singing. The voice is tremulous. The full force of the tone is lacking from an inhibition or inability of the will to send forth from the brain centres those impulses which impart volume and strength to every muscular movement, but *par excellence* to those of the organs of the voice.

We must now refer to the influences which are directly or indirectly concerned in the production of nerve atony. Already we have said that they are, first, inherent to the individual, *i. e.*, intrinsic, and second, due to environment, or extrinsic.

Of the first, everyone's experience and the history of speakers, singers, etc., afford innumerable examples. Deep mental impressions seem often to be ineradicable. Demosthenes, we are told, had an impediment in his voice, which was overcome only by his repairing to the seashore, and with a pebble in his mouth persevering until the defect was removed. Doubtless the impediment was due, as in other cases, to some nervous cause, and the constant endeavors to overcome the failing was aided by the imagination, he thinking that the pebble helped him, but principally by the careful attention he gave to the use of his voice. But volumes might be written regarding the effects of mental impressions and their results. For our purposes it suffices to know that they exist, and that as all experience shows they gain an undue influence over persons when through any cause, hereditary or induced by external influences, the brain does not strongly perform its functions and the mind does not maintain its equilibrium.

I shall do little more than indicate the source of those influences tending to lessen nerve force. With such an audience as this I know not where to start; but perhaps to a musical audience I may first direct attention to enthusiasm. As music, whether of the instrument or the voice, appeals in so large a degree to the emotional nature, or depends upon the sympathetic nervous system, and since the latter regulates the bloodvessels and the gland-

ular system, it will be seen that an undue tension upon the latter must in a marked degree affect nutrition. Exhaust by the absorbing character of practicing, teaching, and the attention and hard work involved in musical recitations of every sort, the energy of the sympathetic nervous system, and you at once have as results a weak or impaired digestion, an imperfect action of the liver and other organs of excretion; while at the same time a vigorous flow of blood in the capillaries is lacking, resulting in a susceptibility to colds. If to this latter we add the fact that the nature of the amusement or occupation involves the returning home often in the chill-moist night air, it will be seen that it is not difficult to connect cause with effect. With the nervous system overwrought or unduly excited an almost invariable result is restlessness and an inability to obtain prompt, undisturbed and health-giving slumbers.

What is more tranquil than a musk-rose blowing
In a green island far from all men's knowing?
More healthful than the leafiness of dales?
More secret than a nest of nightingales?
More serene than Cordelia's countenance?
More full of visions than a high romance?
What but thee, Sleep? Soft closer of our eyes.
Low murmurer of tender lullabies.
Light hoverer around our happy pillows.
Wreather of poppy buds and weeping willows.

If, following a restless night, the routine of our duties demands, as I learn from many students of music, six hours' practice at a piano or several hours' use of the voice, I fail to understand how the singing can be effective in results; or how such continued use of the voice, the organs of which are not in full tone, can end in anything else than disaster. I feel, then, on this point I ought to speak most strongly, notably to young singers. These have the enthusiasm of youth, and especially of young singers, while their organs of voice have not yet attained to that developed firmness of tissue, associated with elasticity, which a long and carefully cultivated voice possesses. Racing horses are not trained in a day, and over-pressure of young animals before their tissues are firm and fully developed has injured many a promising colt, while the queens of the turf have usually been animals not highly trained until they are fully grown and their muscles strong and vigorous. Associated with and,

indeed, a part of this excessive devotion to study, is usually observed a proportional neglect of normal and sufficient exercise of other parts of the body. Fagged after these excessive draughts upon the nerve centres, many are in no state to desire or enjoy physical exercise. Rest, not walking or riding, seems more in order; so that apart from lack of sufficient use of the muscles of the body generally, the advantages to be gained from fresh outdoor life are in large degree wanting.

I cannot leave the subject of the lack of out-door physical enjoyment without saying what I have often felt, viz., that it involves on the part of the singer a great loss of the power and ability to sing, with intellectual appreciation and sympathetic utterance, much of the finest of our poetry. We have seen where resides the spirit of poetry and where music was born.

He was a poet, sure a lover, too,
Who stood on 'Latmost' top what time there blew
Soft breezes from the myrtle vale below,
And brought in faintness, solemn sweet and slow,
A hymn from Dian's temple. While upswelling
The incense went to her own starry dwelling.

In older countries, where "the long result of time" has evolved the highest ideals of art, it is everywhere recognized that "Nature never did betray the heart that loved her," and that to her lovers alone does she whisper her deepest secrets.

Says W. Christian Symons, an English artist, in a recent article on Newlyn and the Newlyn School: "Since the time of Turner, Newlyn (a little Cornish village on the sea cliffs near Penzance) has been a favorite resort of the artist; but until lately almost everything painted there was of the nature of a view or a 'bit' of landscape. . . . Now, however, many of the men who have settled there paint figures—and they paint them out of doors. . . . It seems at length to have been discovered that it is impossible to paint in the atmosphere of a town studio, and from a pallid professional model, inaccurately draped, a picture adequately representing, say, a fisher girl on a beach in sunlight. And yet this, or such as this, is what was done, or at least attempted in the conventional past; nor has the effort been as yet totally discontinued."

But much as I would like to digress and further dwell on this interesting subject, I must pass on to another matter. In the life of singers, more or less artificial, in our modern so-called civilization, there is another incidental matter worthy of our

attention. It is the matter of bathing, properly and systematically carried out. I have noted how lowered nerve tone exposes the person to malign external influences. Let any one notice how easily, tired and exhausted, he is affected by a raw, cold wind. Why it is we can readily understand when we remember that, as already said, every cell of the body, including the integument, has its nerve filament. Now, the cold, damp wind passing by abstracts bodily heat from us. First is the temporary chill of a part, and then the nerve centre responding to the need causes a fresh and sudden flow of blood to the part, and the rosy cheek and glow of warmth returns. But with a deficient nerve force and an impoverished blood this will not happen. The body becomes thoroughly chilled and evil results follow. Now, if every morning, though feeling languid and unrested, a quick sponging with water as nearly cold as can be borne without producing a chill is engaged in, followed by a smart frictioning with a flesh brush or crash towel, the blood rushes in full volume to the skin, and its capillaries and nerves rapidly develop a tone and resisting power only to be appreciated by those who have systematically followed up the practice. More than this, the skin, a great excretory organ, does the work of eliminating worn-out products from the body, and thus promotes an oxidation of the tissue elements and the replacing of them by firm, newly-elaborated products.

Nor can I do more than indicate the need for a careful regulation of the hours for meals, and the use of nourishing and digestible foods. It may be true that the gentle lark rising higher and higher finally melts into an invisible cloud of melody, but reappearing sooner or later it undergoes on *terra firma* the prosaic process of stocking its larder before another triumph of song. My observation of figures of the classic Muses has led me to believe that their outlines had a rounded beauty and symmetry, not aerial in the sense of being transparent; and that even the fabled gods were not averse to their nectar and ambrosia. A good appetite and digestion are not unimportant factors to those who would court the Goddess Polyhymnia in her sacred abode. Neither must those who would emulate the lark in its flights into the empyrean forget that in these rarefied upper regions the atmosphere is, as upon the delectable mountains, wholly uncontaminated by the denizens of the nether gloom.

And the ethereal mould

Incapable of stain would soon expel the mischief.

On the other hand, they must fully realize that it is in the foetid air of crowded halls, in many sleeping rooms and, indeed, in house atmospheres generally, that

Nature breeds,
Perverse, all monstrous, all prodigious things,
Abominable, unutterable,

as our own Milton hath it, and I think he must have meant, even though he did not mention them, those microbes which to-day seem to be the origin and fountain of all evils.

I have reference to those malign external influences which must be guarded against if we are to maintain in a high degree our nerve force; but the subjective or internal influences which play their part for good or ill must not be forgotten. Worry, ambition to succeed, impatience at failure and many other influences, it must be remembered, make heavy draughts upon the nervous energies.

Mens sana in corpore sano ought to be the motto of the speaker and singer, and indeed of all whose duty or pleasure it is to appear before the public in the capacity of instructors or entertainers.

Of course, I am aware that to votaries of the Muses these earthly clogs are not supposed to cling. As Carlyle tells us of the French philosopher, Diderot: "King Denis, in his furnished attic, with or without money to pay for it, was now living and reigning like other kings 'by the grace of God,' and could nowise resolve to abdicate. Meantime he is likely to be overtaken by one of the sharpest of human calamities, cleanness of teeth."

However, I imagine that if we are less *un philosophe sous les toits* in so far as this refers to the care we exercise in maintaining by every available means an "æquanimitas," as Prof. Osler has recently so eloquently talked about in a valedictory to the graduating class of the University of Pennsylvania, we shall not in the end be less musical because more practical. He said: "In the first place, of all qualities in the physician or surgeon no one takes rank with imperturbability, and I purpose for a few minutes to direct your attention to this most essential bodily virtue. . . . Largely a bodily endowment, there are those among you, I regret to say, who may never, owing to congenital defects, be able to acquire it. Education will do much, and with practice and experience the majority of you may expect to attain a fair measure. The first essential in the development of imperturbability is to have your nerves well in hand."

The more we have studied the history of events and the lives of men, in proportion as we have observed around us men and their doings, the more we appreciate the truth of what Carlyle says: "Thus is true, moral genius like true intellectual, which is indeed but a lower phasis thereof is, 'ever a secret to itself.' Enough, if the fact itself becomes apparent, that Nature so meant it with us; that in this wise are we made. We may now say, that view man's individual existence under what aspect we will, under the highest spiritual as under the merely animal, everywhere the grand vital energy, while in its sound state, is an unseen, an unconscious one; or, in the words of our old aphorism, 'The healthy know not of their health, but only the sick.'"

Ladies and gentlemen, I have ended. In endeavoring to deal with a subject essentially scientific in its character before a popular audience, a lecturer finds a very great deal of difficulty in maintaining the *via media*. Afraid of using a technical language and of appearing too scientific, he may err by dealing only in generalities and of being accused of supplying milk for babes. If, acting upon that hackneyed old proverb, *Incidit in Scyllam qui vult vitare Charybdim*, we endeavor to avoid the rock of technicalities, we are in danger of being borne away in the whirlpool of commonplaces. Yet I trust that I have not wholly failed of my object—that of saying something which may be of service to those who as shepherds and maidens of the Latmian land, are going up from its hills and vales in company with Endymion, their lord, bringing their gifts of prayer and music to the great god Pan, the tutelary deity of their art.

Whether I have succeeded or not, I pray you to remember me but as one of the many, and not the master-bowman in old college halls, of whom our Tennyson sings:

Where once we held debate, a band
Of youthful friends, on mind and art,
And labor and the changing mart
And all the framework of the land.

When one would aim an arrow fair,
But send it slackly from the string:
And one would pierce an outer ring,
And one an inner, here and there.

And last the master-bowman he
Would cleave the mark. A willing ear
We lent him.

I thank you most sincerely for the willing ear you have lent me.

Relation of Sanitation to Municipal Government in Wisconsin.¹

BY U. O. B. WINGATE, M.D.,

Commissioner of Health, Milwaukee, Wisconsin.



THE enormous strides made in the progress of sanitation during the last two generations admonish us that any neglect or lack of interest in this important work will be sure to reflect upon the medical profession, which has thus far occupied the position of an advanced guard in this great department of human endeavor.

Like almost every other department in our profession, this is one of constant growth, for the more we are able to unravel the secrets of nature the more we find remaining to be investigated.

In modern times perhaps there is no greater question, involving as it does the life and happiness of our nation, than the relation of sanitation to municipal government. Especially is this important to young and growing municipalities in our own country, for it requires but little study and observation to recognize what disastrous consequences have resulted in older cities of the world when the importance of this great question was not heeded or understood.

In our own State of Wisconsin we are scarcely in our infancy in this important work—nay, we may say, not only in Wisconsin, but in our entire country. The first State Board of Health in this country was not organized until June, 1869, less than twenty-three years ago, Massachusetts leading the list; Louisiana and California, 1870; Minnesota and Virginia, 1872; Michigan, 1873; Maryland, 1874; Alabama and Georgia, 1875, and Wisconsin, 1876, and immediately after that eleven more States followed in the wake. Less than fifty years ago Boston, one of the oldest cities in our country, had no public water supply, no system of sewerage. Milwaukee, the metropolis of our own State, now having a population of over 230,000 souls, and increasing at the rate of nearly, if not quite, 1000 per month,

¹ Read before the Wisconsin State Medical Society, 1892.

had no sewerage system until twenty-three years ago, and no public water supply until about twenty years ago.

When these two systems were constructed but very little thought was given to the requirements of future generations from a sanitary standpoint, and this statement is not made as a criticism on the labors of those who have adopted such systems, for at that time knowledge in regard to such matters was very limited, and the means of study and observation that we now possess were entirely beyond their power to obtain.

It was not until 1871, when an epidemic of cholera was threatened, that the American Public Health Association was organized. This association was composed of the most eminent sanitarians of the country, and probably owed its existence to the different State Boards of Health, and medical officers of the army and navy.

This body has had a marked influence upon the public health legislation in the country, and was largely instrumental in the establishment of the National Board of Health which, unfortunately, came to an end in 1883 by limitation of an act of Congress, and for which Congress refused to appropriate means for a continuance of its work, much to the detriment of our boasted enlightenment and civilization.

These two examples cited, furnish only a key to many others throughout our country that might be mentioned, for in every city that one may enter, the most difficult sanitary problems may be found awaiting solution.

The reason for this state of affairs is plain, but to solve the problems is a more difficult matter. Cities of the United States have grown up rapidly, and the ambition to become wealthy has prevented a taxation of property sufficient to make the necessary permanent improvements that would conform to good sanitation. Politics, the bane of municipal growth in this direction, exerts a too prominent influence in every city of any size to admit of a wise consideration of this subject. The moment that the party in power, and it makes no difference which party it is, attempts to make any permanent improvements in a municipality, and increases taxation, which is necessary for such improvements, the opposing party at once charges the party in power with reckless extravagance of public funds, increased taxation, and the robbing of the poor man of the products of his labor. This is undoubt-

edly the most successful method of procedure known to municipal politicians of the present day to manufacture votes for a party that is out of power and wants to get in ; therefore, no party in power in any municipality, if it understands the need of good sanitation, dares to incur the necessary public expense to institute and carry out permanent sanitary improvements. The result is that in every city in this country are found the most superficial and temporary expedients in nearly all sanitary work, and every year the problem becomes more intricate and difficult of solution, for the evils multiply as the population in each city increases.

In the older cities of Europe we find a different state of affairs. Many have passed through the bitter experience of neglect in this matter ; waited, as did London and Berlin, until epidemics swept off nearly half the population, and then they went to the expense of making permanent sanitary improvements. Paris, the city to which all sanitarians point as an example of perfect sewerage and clean streets, did not wait for an epidemic before making this great improvement, but levied a tax sufficient to pay for this important piece of work before the city had attained its present size—a tax that if suggested in this country would drive our people frantic. And yet it would be the wisest policy that could be adopted.

One great lesson, apparent to all students of sanitary municipal government in this country, is that in all cities of any size nature is being over taxed at the expense of growing wealth, and this is the problem that in our own State of Wisconsin, we, as physicians, the guardians of life and public health, should carefully consider.

The State of Wisconsin, by its size and natural location, furnishes one of the sublimest spots on the face of our earth for the enjoyment of a long and healthy life, and it depends much upon the medical profession, the only true guardians of the public health, whether or not this reputation shall be maintained. The State contains nearly 54,000 square miles of territory, which is nearly as much as have England and Wales together. Its municipalities are springing up in all locations, and we have to day about twenty-five cities numbering in population from 2000 to 5000, thirty that number from 5000 to 25,000, and one that ranks fifteenth in size among the cities of our country, containing a population to-day of over 230,000 inhabitants.

The importance of sanitation to these growing municipalities cannot be too highly estimated. And yet who, except members of our own profession, will take any advanced step in regard to this important question? Who, except members of our profession, are able to understand the necessity for a proper and wholesome water supply, a proper system of drainage, a proper construction of our public school buildings and the limitation of school attendance, proper construction of public buildings in general, and the homes of our citizens, and proper laws to protect our people from the ravages of contagious disease?

Do the public not expect us, as persons supposed to be educated in these matters, to take an active interest in such work? Are we doing our duty in this regard? Are our laws pertaining to sanitation in municipalities the best and most effective that can be devised? Or is it unnecessary to have sanitary laws on our statute books, as some have maintained?

These are questions that we, as physicians, should consider, discuss fully and settle permanently, and the sooner it is done the better.

The balance of legal power in sanitary matters in the different municipalities of our State is lodged with that body known as the common council. Each municipality is legally governed by a city charter that consists of certain enactments passed by the State legislature, and pertaining to the locality in which the municipality exists. These charter provisions are supposed to be drawn so as not to conflict in any way with the general statutes of the State, but our law-makers have not deemed it necessary, in many instances, that these provisions be fully equal to the provisions of the general statutes, and the provisions of many city charters in this State, so far as sanitary laws are concerned, are not equal to the general statutes. The result is that in many instances the boards of health in towns are endowed with greater legal power under the general statutes than are some of our city health officers, who are confined to the provisions of the charters of their respective municipalities, together with the ordinances that their common council see fit to pass. A proportion of the city charters of our State confers certain powers upon the Board of Health, or the Commissioner of Health, but a large proportion of this legal power is lodged with the common council, which has the right to make such sanitary laws as it may see fit by ordinance.

Now, the objections which are found by practical experience to having the balance of the power left to the common council to provide necessary sanitary laws (and I think it goes without saying that sanitary laws are absolutely necessary), are manifold.

In the first place, the majority of the members in our common councils have little or no knowledge, are not supposed to have, nor can they reasonably be expected to have knowledge of sanitary matters. This knowledge can only come from special study and observation, and must be considered as expert knowledge only.

In the next place, if a health officer attempts to have certain sanitary measures passed by a common council, it often happens that he meets with the greater obstacles for the very reasons before mentioned, and it requires the utmost amount of patience, tact and diplomacy in order to prevent the most serious and disastrous friction. But few health officers can or will be found who will perform their duties to the public in a manner that will be in accord with the best sanitary knowledge of to day, and not be constantly involved in a most serious and damaging contention with a portion, if not all, of the common council. Then again, it is exceedingly difficult to pass a health ordinance in a common council that will not contain some flaw, and that will stand the tests of the courts, or that is not liable to prove obnoxious to a portion of the council or their constituency, and therefore constantly be subjected to repeal or alteration, while a law passed by the State legislature is more liable to be free from legal flaws, and must stand at least two years' test before it can be repealed or amended.

On the other hand, it is found to be extremely difficult to get proper sanitary laws passed, such as are best adapted to the needs of our municipalities, by our State legislature, composed, as it often is, of men from the rural districts, who do not realize the needs of our municipal life.

The difficulties met with in regard to legal enactments, both in State legislatures and municipalities, have undoubtedly led some superficial observers to the belief that better results would be obtained without, than with, sanitary legislation. But one fact is positively evident to every student of sanitation, and that is, in the countries where the most rigid sanitary laws are enacted and enforced there we observe the most positive results

of sanitary work in the reduction of preventable diseases and the lowering of the percentage of the human death rate.

While we cannot follow in this country of ours certain laws concerning the rights and welfare of the people that are enforced under other forms of government, is it not a fact that laws pertaining to the preservation of human life and health must be similar in our country? Do not the same natural laws and the scientific knowledge recognized in all parts of the civilized world hold good in all parts of the world inhabited by man? And must we not recognize that these laws must be separate and set apart from the laws that govern the political or commercial government, not without reasonable basis, contend that our city governments in this country, as compared with those of the Old World, are failures?

Cities like London, Paris, Berlin, Vienna, Birmingham and others, are referred to as illustrations in comparison with some of our own larger cities. And certainly, if we observe the laws enacted and enforced in these cities pertaining to sanitary matters and compare them with our own laws and the indifference which is shown them, not only by our people, but by our legislators and some of the lower courts, it is easy to understand why our municipal government, so far as sanitation is concerned, is a failure.

In this relation permit me to quote the words of one of our most learned and observing thinkers and writers on municipal government:

“One would imagine, *a priori*, that government by the people, for the people, would always have been careful of the people's health; but here we come upon one of the most conspicuous of free institutions in urban populations. Democratic government is at present at a serious disadvantage in comparison with aristocratic and monarchical governments as regards the care of public health. The evidence of that disadvantage is of two sorts. In the first place, there are several cities in the United States which already, in spite of their comparative newness, have a death rate absolutely higher than that of the best conducted cities of Europe. In the second place, in those American cities which have made some effort to preserve the public health and to lower the death rate, no such success has rewarded the effort as in many European cities, although the newness of most American cities should give them great advantage over Europe.

What are the reasons of this comparative inefficiency of democratic government in the care of public health? I maintain that they are not vice and criminal negligence, but ignorance and unwisdom. Is it not obvious that the care of the public health requires a high degree of intelligence and of scientific training in the officers who have charge of it, and that our system of municipal administration almost precludes the employment of such competent officers?

“Preventive medicine is a comparatively new science, and it has been more effectively cultivated in Europe than in this country, partly because the methods of municipal administration which there prevail give a chance of putting its principles into practice which American methods have not given.

“In its respect for personal liberty and the rights of the individual, democracy lets ignorance and selfishness poison water supplies with fæcal matter, distribute milk infected with diphtheria, scarlet fever, or tuberculosis, and spread contagious diseases by omitting the precautions of isolation and disinfection.

“Clearly this feebleness of democracy is largely due to ignorance. Aristocratic and autocratic governments have learned quicker than democracies the economic and human value of sanitary science, and have applied that science more promptly and efficiently. If the sufferings inflicted on the poorer and less intelligent portions of the community by incompetent practitioners of medicine and surgery could be brought home to American legislators, the quacks and charlatans would have short shrift, in spite of the inevitable interference with so called private rights. Registration acts for practitioners of medicine would be promptly passed and vigorously enforced. In like manner, if a democracy were only persuaded that contagious diseases, like yellow fever, smallpox and diphtheria, might be closely limited by isolation, the present careless method of dealing with these scourges would soon be as obsolete as surgery and midwifery without antiseptics.

“The multitude does not know how typhoid fever lurks in contaminated water; it does not comprehend either the suffering or the economic loss which inevitably falls on any population breathing polluted air, or drinking polluted water; it does not realize that public health is only the sum-total of the individual healths, and that every avoidable injury to public

health means individual sufferings and losses which need not have been incurred.”¹

Is it not evident that our profession has a most important mission to perform in attempting to enlighten the public intelligence in regard to the importance of these measures? Is it not evident that sanitary laws are necessary, and that they should be vigorously enforced? And are such laws to be considered infringements on personal liberty? Is the attempt to save human life and preserve the health of a people to be considered a blow to personal liberty under our free institutions? If such be the case, it is a strange interpretation of the principle of “life, liberty and the pursuit of happiness,” which our forefathers so wisely established, so heroically maintained and handed down to our keeping.

Upon what line of action our profession should engage to perform our duty in this direction may be a question which will not be out of place for us to consider. It is not my purpose to dictate such a line of action, but to simply offer a few suggestions which have occurred to me, and if they should claim your kind consideration, or criticism, I shall feel amply rewarded for my labor.

In the first place, I believe all sanitary laws and regulations should emanate from the medical profession. It is, of course, proper and right that the work of legal construction be done by the legal profession, but for the legal profession to dictate sanitary laws is as absurd as it would be for a body of physicians to attempt legislation to meet the needs and prescribe the functions of the legal profession.

There is at the present time in our State a strange and exceedingly unfortunate lack of harmony between the legal and medical professions. This state of affairs should not be allowed to exist. Sanitary law may be defined as the proper application of the principles of preventive medicine to the administration of law, and here, as in medical jurisprudence, of which sanitary law at the present forms a part, there should exist the most harmonious relations between these two foremost professions in the world.

Medico-legal societies should be formed in every city of any size in the State, patterned after the Medico-Legal Society of New York, which has in the few years of its short existence

¹ President Eliot, of Harvard University, in the “Forum” for October, 1891.

brought together in harmonious action the most prominent physicians and jurists in the world; and by such associations not only the matter of sanitary law would be advanced and properly executed, but the relations of the two professions would be better understood, and medical evidence in our courts would be elevated to the position to which it is entitled, which would prove to be the greatest step in our generation toward that justice which belongs to a free and enlightened people.

In the second place, members of our profession should take a lively, well-organized and harmonious part in passing such uniform sanitary laws by our State legislature as will conform to the most advanced sanitation of our day and time.

In the third place, a mighty effort should be made to rid our municipal Boards of Health from the yoke of political bondage, and if this work be begun and manfully pursued, public sentiment will sustain it.

No one can accomplish this Herculean task alone, but by a strong, united effort our profession can teach and convince a people, who are willing and anxious to learn the truth in these matters, that that municipality will be the most prosperous, and its citizens will attain to the highest degree of moral, religious and intellectual development and human happiness, that early lays the foundations for, and strictly observes the laws of, sound and correct principles of good sanitation.

The Hygiene of the School Room.

BY WM. THORNTON PARKER, M.D.,

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THOSE of us who were schoolboys before the war, and who have now children of our own at school, must view with considerable pleasure and appreciation the great changes which modern educational methods have brought about toward the needed reform in the hygiene of our schools.

We, as Americans, are so apt to believe, from the many compliments our school system receives, that our schools, if not actually superior to all others in the world, are second to none. We are in

this respect like those who have staid at home and are ignorant of the great things in life. The same spirit is shown in the experience of an Indian who, upon returning to his tribe after a visit to the great cities of the States, attempted to explain what he had seen, and was killed by the exasperated savages, who believed that he had some method favorable to the palefaces, for his outrageous stories of the wealth and strength of the American cities.

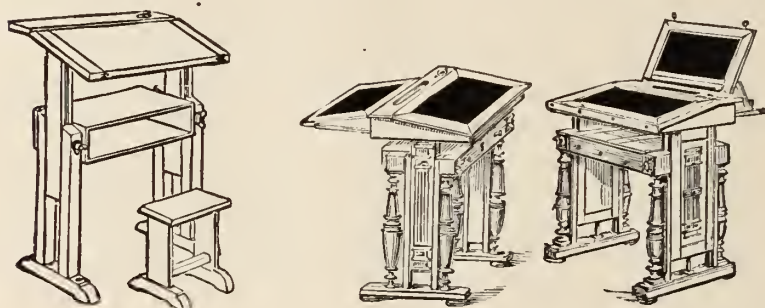
So it is with many of our school teachers; they know little of the requirements for scholars, or of the efforts made in foreign countries for their health and comfort. We build grand buildings with long flights of stairs, exteriorly and interiorly, and are blind to the fact that running up and down stairs is a positive injury to our children, and a beginning often of serious heart and lung disease. With too long study hours, with rooms too hot or too cold, with faulty and imperfect systems of ventilation, with desks made in so many sizes which the student must fit, or remain uncomfortable in during school hours, with all these serious defects in our school system, and with many in the methods of instruction, we have certainly occasion to pause and consider if decided reform is not urgently needed. A visit to a modern high school in any American town will convince us that very many of our students are quite uncomfortable, are studying at a great disadvantage, and are frequently exposed to serious dangers to health. Sometimes these infamous influences will be sufficiently powerful to exert a lasting injury upon habits of study, and reading, and thinking, as well as inflicting permanent bodily defects.

Many a case of fatal consumption has its beginning in the school room, and is the result of the carelessness or ignorance of the school teachers or school boards.

Secretary Bayard's famous speech to our young men, in which he urged them to "scorn delights and live laborious days," has the true ring in it, and we need only to consider the school days of our brave fathers who studied under the most trying conditions and acquired excellent educations, to feel almost ready to hesitate to suggest any further comforts for our children. But the hardships of our courageous ancestors bore its fruit of suffering in their children, and we are undoubtedly unfortunate in that duty and necessity made their lot so hard. While it is true that discouragements and obstacles are not able to successfully oppose manly effort in winning an education any more than in deterring any worthy enterprise, yet improvement is the order of the day,

and the hygiene of the school room is demanding intelligent attention. Progress everywhere is the action of all legitimate life.

If we look about the school rooms and watch the girls and boys at their study tasks we can see at a glance that most of them are not as comfortable as they ought to be, or as they could be with a very moderate expenditure of time and money. The school desk is one thing urgently requiring faithful attention. Much of the injury done by faulty desks is offset by the benefit of military drill, but the most perfect system of exercise cannot wholly atone for hours spent in irrational and faulty positions. The desk affords no place for the book while writing, and offers an unfavorable position during study hours. To be sure, all writers suffer more or less from this absence of comfort and health in our study tables. What with books, and pamphlets and letters, and circulars, and



memoranda of all kinds littering our writing tables, it is a wonder we can write at all, but our scholars have a right to a more rational condition of things on and about their desks. In the *Journal d'Hygiène* (Paris), February 23, 1893, I have found an illustration of a desk which is peculiarly suitable for schools, and need not be objected to on account of expense. In the first place this desk is made to suit the convenience of the scholar, and it can be readily adjusted for any and all ages. It can be elevated or depressed, and gives ample room for writing, and a suitable rest for books of reference, etc. This book rest is so constructed that fatigue is obviated—the angle for vision is correct, and the student is relieved of much annoyance and of the injurious influences already referred to. From the foregoing we are reminded that the desk is an important factor in maintaining health or in injuring our school children.

There are many features well worth consideration in the hygiene of the school room. In succeeding papers we hope to call attention to several important matters in this connection, and also to make an earnest plea for the regular instruction in "First Aid to the Injured" for those fitting to act as school teachers. For several terms these lectures have been given at the State Normal School, in Salem, Mass., under the auspices of the Massachusetts Emergency and Hygiene Association, and with very gratifying success, and with the earnest appreciation of the members of the class. A school "Red Cross Cabinet" has been devised so that emergency remedies and appliances can be on hand at the school rooms, with intelligent teachers ready and able to use them. This certainly marks an era of progress in education.

How to Secure Lung Capacity.¹

BY PROF. G. D. STAHLEY, M.D.

 IN a previous article I made the statement that the breathing apparatus was for the purpose of facilitating the interchange of carbon-dioxide and oxygen to meet the demands of a vital necessity, and also to provide a mechanism for producing an upward air current for purposes of phonation.

The lungs are the most important organs of this breathing apparatus, and it follows that the more functionally capable these organs become the better do they serve the body. In our efforts to secure the greatest efficiency we must direct our attention to the development of lung capacity. This capacity is always in proportion to the number of air sacs in the lungs which are actually in use. Of the estimated 6,000,000 of these air sacs it is not probable that an average person habitually uses more than one-half or two-thirds of them. In order, therefore, to develop lung capacity we must endeavor to bring in constant use more and more of these air sacs, until finally we become the possessors of our rightful breathing powers.

The first step in this effort must be to develop an enlarged chest cavity, so that the contained lungs may have ample room

¹ From the Gettysburg College Monthly.

for dilatation. An elastic and expansible substance like the lung tissue must have space to properly exercise its function. The exercise of the ordinary and supplemental muscles of respiration will enlarge the chest and the chest cavity. This principle is recognized in the Sylvester method and the Marshall Hall method of resuscitation from drowning. The effort in these methods is to so manipulate these muscles of respiration as to enlarge the chest cavity and invite the air to rush into the lungs and inflate them. On this same principle is demonstrated the great benefit derived from much of the chest work in gymnastics. Exercises on the traveling and flying rings, the parallel bars, vaulting bar, etc., as a rule develop chest capacity. But this does not always result. 'Tis true we observe great development in the muscles of the chest and upper back, so that while the outside girth may be greatly increased, there is not a corresponding enlargement of the cavity within. We find, therefore, that attention to the ordinary and supplemental muscles of respiration is not of itself adequate for the purpose desired. It is necessary that we shall also pay great attention to the lungs themselves—these must be specially exercised.

When we study the substance of the lungs we find that the air tubes of medium size are composed mostly of muscular tissue, and that as they become smaller fibro-elastic tissue is added, and that between and in the walls of the air sacs fibro elastic tissue alone rules. Hence we have here a great mass of impressionable muscular and fibro-elastic tissue which is functionally amenable to influences and capable of growth and development. Those air sacs which are in use can be made to respond more actively, and those unused ones can be trained to healthy exercise.

The lungs can, of themselves, be made to exert a powerful force in securing that chest capacity which shall in its turn make greater lung capacity possible. A full and complete inspiratory act consists not only of the active participation of the inspiratory muscles with the passive distension of the lungs by air pressure, but the lungs themselves are in an important and necessary sense *also* active, and by repeated exercises in deep breathing become developed, so that the increase of the chest walls and the increase of lung bulk proceed *pari passu*, and eventuate in greatly augmented air capacity.

The respiratory muscles cannot of themselves enlarge the

chest cavity. This is shown by our inability to raise the ribs by an inspiratory effort, while at the same time we keep our mouth and nostrils closed. This is also shown by the great difficulty which asthmatics experience while the paroxysm is upon them. The muscles of respiration labor hard and faithfully to do their part of the respiratory act, but because of the spasmodic contraction of the bronchioles, or minute air tubes, the lungs are unable to do *their* part of the work, and hence very imperfect and distressing respiration is the result. Also when the lungs, or a portion of them, are engorged with a superabundance of air, as in the case in that disease called emphysema, the expiratory muscles are not capable of adequately performing their work; in such cases mechanical devices are often applied so as to compress the chest and thus aid the act of expiration.

Thus we find that the respiratory muscles and the lung tissues are very essentially helpful to each other, and dependent on each other.

Respiration does not, therefore, only indicate for the lungs alternate conditions of inflation and collapse, subservient to the action of the breathing muscles and the laws of atmospheric pressure, but, on account of the muscular fibres which exist in the bronchioles and the elastic tissue of the lung substance, the lungs are themselves active contracting and relaxing agents, and are of equal importance with the muscles of respiration in expanding the chest walls, enlarging the chest cavity, and showing in their own augmented air capacity the truth of that physiological law that exercise amplifies function.

What practical inference may we draw from these statements? This,—That those physical movements or exercises which train and develop the muscles of respiration are of prime importance and should be sedulously practiced, and *also* that those correct methods of deep breathing which are designed to thoroughly expand all the air cells and train the lung tissues are of equal value and must receive equal attention.

It is often beneficial to combine breathing exercises with muscular movements of the chest. This can very conveniently be done in the gymnasium in connection with free-hand exercises, or with clubs or bells. The chest weight and the traveling parallel bars are also well adapted to such exercises. In combining breathing exercises with gymnasium work great care must be taken that the breathing is of the diaphragmatic type, as

mentioned in a previous article, and not of the upper chest or collar bone type, to which among the careless it is prone to tend.

In our efforts to secure good lung capacity we must not forget that very essential condition—a responsive and well-disciplined control of the breathing act. This becomes possible through an admirable nervous mechanism which is capable of infinite development and adaptation. We must not only have plenty of breath, but we must also have it under obedient control, or it will serve us no useful purpose either in actual muscular work or in voice production.

The physiology of the breathing apparatus is truly wonderful. There is a respiratory centre at the base of the brain which has the double function of stimulating or repressing either the inspiratory or the expiratory act obedient to the automatic urgings it receives from the nerves of the body which centre there, or because of the volitional impulses of the individual. Dr. Foster, the eminent physiologist, says: "The respiratory centre responds in the most intricate and varied manner to nervous impulses proceeding from all parts of the body, and thus delicately adjusts the working of the respiratory pump to the needs of the economy." These impulses may arise from physical impressions on or in the body, or they may have their origin in the intellect, or may be directed by the emotions. In this way, volitionally or unconsciously, the respiratory function is influenced by mental and physical conditions, and in its turn this function becomes the outward interpreter of the unseen mind and body.

No one ever becomes an impressive or persuasive public speaker who has not a good lung capacity and a well-regulated control of breath. It may require considerable voluntary effort to train and educate the respiratory mechanism to a valuable degree of efficiency for purposes of voice production. But so sure as the awkward, exasperating and mind-fatiguing efforts of the amateur pianist finally produces easy, artistic, and unconscious action of the fingers on the key-board, so will voluntary but persistent efforts in training for lung capacity and control of breath soon lead to the development of vast unconscious power. Providence has given us mechanically perfect respiratory organs, and has endowed them with wonderful possibilities, and it remains for us to use them efficiently, neglect them or actually abuse them.

An Epidemic of Smallpox.

BY C. A. LINDSLEY, M.D.,

Secretary of the State Board of Health of Connecticut.



SMALLPOX invaded Connecticut in the county of New Haven and vicinity about the same time at several different points. The first discovery of its presence was in the New Haven hospital. On November 1 two patients were admitted to the hospital; one was an employee on the line of steamboats running between New Haven and New York. The other had been sent from the neighboring town of Derby for treatment. Each had a scattering eruption upon the face and some other parts of the body. Neither gave any history of fever, headache or backache, and the true character of the disease was not recognized until the eruption was sufficiently developed to be distinctly characteristic. In the meantime free intercourse with the other inmates of the hospital had been allowed, and the full extent of the exposure could not be definitely determined.

The health officer of New Haven was notified, who at once ordered the whole institution to be under rigid quarantine restrictions, and all personal intercourse with the world outside the hospital grounds was prohibited. Although most of the patients in the hospital had been previously vaccinated, a general vaccination and revaccination was practiced as soon as sufficient virus could be obtained. But unfortunately it was too long after exposure to be protective in all cases, and eleven cases of varioloid broke out from this direct exposure between November 12 and 20, of whom one died—a little colored girl—far advanced in tuberculosis. Some of these cases were so irregular, the prodromal symptoms so mild, and the eruption so slight, that the diagnosis was difficult, and under other circumstances would have been entirely overlooked.

As fast as the cases presented they were removed to the isolation hospital provided by the town, and there was no communication of the disease to the citizens of New Haven until December 8, when a colored servant in the family of the physician attending the cases at the isolation hospital sickened with it. She

had obstinately refused to be vaccinated, and was discharged from the service of the doctor's family some time before she was taken sick. She is now in the isolation hospital.

The case admitted from the town of Derby had, it is believed, already communicated the disease to six others with whom he had been socially intimate, one of whom suffered so little personal inconvenience that he continued at his daily work. Another was supposed to have given the infection to a young woman whom he escorted to a dancing party. The whole result of the Derby case thus far is twelve cases, to wit: Nine in Derby, two in Ansonia, and one in Shelton; the latter places lie adjoining Derby. Of these two died. The last case reported from Ansonia was taken December 12.

In the latter part of November smallpox appeared in the person of a two-year-old child, in the town of Bethel, about twenty-five miles west of Derby. In this case the father of the child was taken sick in New York City, and treated for chickenpox. His mother went to see him, and brought her grandchild to her home in Bethel. In a few days the New York physician discovered his error, and the supposed chickenpox case was removed to the smallpox department of Riverside Hospital. The health department of New York, knowing the child had gone home with its grandmother, notified the health board of Danbury, adjoining Bethel, of the condition of the father. The health board of Danbury found the child in Bethel and vaccinated it, but did not notify the health board of Bethel. Consequently no further attention was given to the matter until the Bethel Board incidentally heard of it on November 23, after the eruption had appeared. Quarantine restrictions were immediately ordered, and a general vaccination practiced on all who had been exposed, and upon all school children. As yet no new cases have appeared.

These cases illustrate a fact which I have before alluded to, viz., that the very rarity of variola and varioloid is a source of danger. There are now many physicians of large experience in general practice who have never seen a case of smallpox. The varioloid cases in particular, which are now altogether most frequent, are quite often without conspicuous symptoms, sometimes with an ill-developed eruption, which does not run its full course, and which may be so slight as to escape attention unless specially looked for. I have seen patients with less than half a dozen pustules on their whole persons.

Such cases might start an alarming epidemic in an unprotected community before they were recognized as varioloid, and possibly without having been recognized at all. In all the recent outbreaks in Connecticut the infection has first been spread by persons supposed to have some other eruptive disease.

Physiology and Education.¹

BY C. E. EHINGER, M.D.



THE exact place which physiology should occupy in the curriculum of our schools and the benefits to be derived from its study are matters concerning which educators hold most divergent views. There seems to be a general acknowledgment that it deserves some place in the education of our youth; but how much time shall be given to it, to what extent it should be taught, and in what grade it is wise to introduce it, are questions still under discussion.

Within the past few years the agitation of the temperance question has served to bring the matter before the teachers, and to heighten the discussion concerning its value as a study. The temperance question has done much to improve the text books in some particulars, and to stimulate more accurate teaching on points relating to the physiological effect of alcohol upon the body. How far it has accomplished the ends hoped for among the temperance advocates it is not my intention at this time to discuss. But before attempting to give my reasons in favor of teaching physiology I must make myself clear by defining what I think the study of physiology should comprehend.

As a science pure and simple, it should have but little if any place in our schools; it concerns us chiefly as a basis for the study of hygiene, and I consider it a most encouraging sign that recent elementary text-books are devoting relatively more space to hygiene.

"Hygiene," according to Parkes, "is the art of preserving health; that is, of obtaining the most perfect action of body and mind during as long a period as is consistent with the laws of life. In other words, it aims at making growth more perfect, decay less rapid, life more vigorous, death more remote." I need hardly

¹ From *The Amulet*.

add, in this connection, that a somewhat imperfect application of what is known of these laws has already produced results so striking that the wonder grows that a greater effort has not been made to obey their precepts.

That there is urgent demand for the better comprehension and more general application of hygienic rules, few, I think, will deny; and this conceded, why is greater attention not given to the study. I will leave my readers to ponder upon the query.

I fully coincide with Dr. Stephen Smith in the views expressed a number of years ago, in his address as president of the American Public Health Association. "Were a well-digested system of education in hygienic matters, which so vitally concerns the well-being of every person, adopted and put into practice with anything like the vigor with which we insist upon the study of the common and useful branches like geography, arithmetic and grammar, and the uncommon or ornamental branches, as French, music, etc., within one generation the whole mass of people would be so enlightened on the subjects relating to the hygiene of every-day life that our average longevity would be immeasurably increased."

Now as to some reasons why teachers and students differ concerning the value of the study of physiology. First and foremost I would place the difficulty of the subject. It is, in my estimation, one of the most difficult of the sciences to teach properly. One of the inherent difficulties lies in the fact that it is not, like mathematics, physics or chemistry, an exact science, and hence requires most careful handling. The inadequacy of the text-books in the past, and the incompetency of many teachers I would assign as another reason; and further, that the subject has often been begun with children too young to comprehend it; while the time allotted to it has been ridiculously short.

The measures adopted for teaching have, as in other branches, also been most artificial and otherwise faulty. Object lessons and practical means of imparting the subject have, until recently, been but little employed.

It is, I believe, not only useless, but may be positively injurious to attempt the systematic study of physiology with young children. The difficulties of the subject are such that no ordinary child can master them. But granting that they might be made to understand it, I am convinced that they would have neither the inclination nor the power to put in practice the rules of hygiene which we deduce from the study. Some of the simpler

hygienic laws and temperance lessons, and some anatomy, may, without doubt, be given with most beneficial results, but never the whole subject of physiology. At the earliest, I would not attempt to teach physiology in earnest by the use of text-books, before the age at which physics, chemistry or botany are usually begun.

It cannot even then be studied to the best advantage without a skeleton, a manikin, a liberal supply of disarticulated bones, models, charts, specimens of bodily tissues and organs, and apparatus for demonstration—in short, a physiological laboratory.

I am aware that this will be looked upon as an unwarranted extravagance by many teachers ; but as a teacher and a physician, I am fully convinced that the importance of the subject not only warrants but *demand*s it.

To properly study physiology some knowledge of both chemistry and physics is required, hence it is most desirable that it should not precede the study of these branches, but should accompany or follow them.

Throughout the course of this study one idea should ever be paramount, that of hygiene or sanitation ; and no opportunity should be lost to make practical application of the knowledge acquired, and to enforce the lessons which can be drawn from every source, but especially from the immediate surroundings. I should devote more space than is even now done by most of the recent text-books to matters pertaining to hygiene in its various aspects. Every effort possible should be made to stimulate investigation and study outside of the classroom, and to awaken a genuine love and enthusiasm for the subject. Teachers should be prepared to give a course of collateral reading, and encourage the students to read some one or more of the better class of health journals ; he should be sufficiently conversant with the standard works of physiology and kindred subjects to give intelligent advice concerning what reference books to consult. For normal schools, I believe the senior students should have a special course in school hygiene.

It was not my intention, however, to go into details as to the methods to be employed in studying physiology, but only to say something of its importance, and the relation which it bears to education in general.

Herbert Spencer says : “ To prepare us for complete living is the function which education has to discharge.” In short, the object of education is to obtain happiness, and since the foundation of happiness is health, and since, in civilized communities at

least, perfect health is not possible without a knowledge of physiology and the laws of hygiene, it ought to be clear to every one that no subject pertaining to our material welfare can out-rank this in importance. The Creator did not intend that man should be weighed down with the load of physical infirmities which he now carries. Sickness and pain is the penalty of physiological misdeeds. The full possibilities of life cannot be realized without health; no other factor contributes so highly to an unhappy life and to an untimely death as ill health. I believe with Dr. Benjamin Ward Richardson that, "By the strict law of nature man should die as unconscious of his death as of his birth. . . . This purely painless process, this descent by oblivious trance into oblivion, this natural physical death, is the true Euthanasia; and it is the duty of those we call physicians to secure for man such good health as shall bear him in activity and happiness onward in his course to this goal. For Euthanasia, though it be open to every one born of every race, is not to be had by any save through obedience to those laws which it is the mission of the physician to learn, to teach and to enforce. Euthanasia is the sequel of health, the happy death engrafted on the perfect life.

"When the physician has taught the world how this benign process of nature may be secured, and the world has accepted the lesson, death itself will be practically banished; it will be divested equally of fear, of sorrow, of suffering. It will come as a sleep."

Now let us briefly consider physiology as it pertains to the mind or to the education of the intellect.

So far as we know, mind is never met with apart from body, and it is both a physiological and psychological axiom that the perfection of its manifestations depends upon the health of the body; so that here, too, the physical as well as the mental must be considered. I would especially call the attention of teachers, both present and prospective, to the study of physiology as a necessary aid in studying psychology. While physiological psychology is hardly a separate branch, it may be said to represent the aspect which the psychology of to-day has assumed. In short, so far as it pertains to the subject of education, physiology is quite generally made the basis of psychology. In the words of Bain: "The mind is destined to be a double study, to unite the philosopher with the naturalist."

The attitude of the psychologist to this subject is well expressed by Joseph Jastrow in the opening paragraph of an arti-

cle on "The Problems of Comparative Psychology," which appears in the November number of the *Popular Science Monthly*: "To any one thoroughly impressed with the intimate relations of mind and body, it seems natural enough that the gradual development and perfection of the one should carry with it analogous stages in the growth of the other; but even the most profound student must at times give wondering expression to the marvelous extent, the endless variety, and the unexpected precision of the inter-relations of the physical and the psychological."

For a clear understanding of the mental processes a study of the brain and nervous system is indispensable. No student of educational methods can fail to note this physiological tendency of modern education. Educational periodicals and recent works on the subject are teeming with suggestions which point to this trend. Did space permit, it would be interesting to point for confirmation of this assertion to the articles which have appeared in educational literature within the past few months.

Strange as it may sound to you, it is nevertheless the fact that the mind does not have its seat wholly in the brain, but pervades the entire body. Every act of which the mind is capable is in reality a physical act, and produces some changes in the materials of the body. The correlation of mind and body is so intimate that the study of one cannot be intelligently undertaken without that of the other.

The materials upon which the teacher must work are the mind and body of the child. It is one of the reproaches of our day that the education of the mind and body have not kept pace with each other. One of the greatest responsibilities which confronts the teacher of the future is the correction of this fault. The efforts of instructors have been directed far too much to the cultivation of the intellect at the expense of the body; but before this evil can be remedied, the human body and its functions must be more thoroughly understood; the laws of growth and development, the needs of the growing organism must receive from the teacher more consideration than they have heretofore.

The changes of structure incident to a higher civilization and the disproportionate training of the nervous organization has resulted in producing a people whose capabilities exceed those of all former time. But coincident with this increase of capacity has come a delicacy and intricacy of adjustment which renders us vastly more susceptible to the vicissitudes of life. The delicate

organism must henceforth be the object of greater solicitude on our part to maintain its perfect adjustment.

This is pre-eminently the era of nervous maladies, and it is of the gravest importance that teachers should have the fullest appreciation of what this signifies, for it is only by the intelligent and concerted efforts on the part of the physician and teacher that corrective measures can be inaugurated. Well-educated teachers can do a vast work in arousing public sentiment in favor of health reforms.

From purely selfish motives, the teachers will find it greatly to their advantage to thoroughly acquaint themselves with the study of hygiene, for few avocations are more arduous, or tend more certainly to induce the very evils of which we have just spoken. How often do we see teachers fall victims to the prevailing nervous diseases.

The human body may be likened to a machine for the liberation of energy which has been derived from air and other foods and stored up for future use. This energy is being constantly expended, and the manner and amount of this expenditure is a question of vital importance. Every outlay should be watched with jealous eye, and the forces conserved for the inevitable conflicts of life.

"The life of the social organism, like that of all organisms, is maintained by combustion, and 'tis not foreign material that is burned in the most active furnaces of life, but the living cellules themselves. . . . The best principle of all moral hygiene would therefore be to persuade the individual to spare himself, not to consider any talent in himself or his children as a goose laying golden eggs; finally, to look upon life as having to be not *exploited*, but preserved, increased and propagated.

"The consequence of this principle of physiological economy in education is the art of measuring and directing culture, especially intellectual culture; of not making it too intense, too limited to a single point of the intellect, but always proportioning its extension and intention."

We cannot continue to spend our energies unless we continually and properly replenish them. Herbert Spencer says: "It is a corollary of that primordial truth which, as we have seen, underlies all other truths, that whatever amount of power an organism expends in any shape, is the corollate and equivalent of a power that was taken into it from without."

The physical energy upon which mental force depends comes from without ; air, water, food, exercise, these are some of the indispensables. The exact requirements of the physical organism for these essentials, their action upon it, and the best means of procuring them, constitutes the science of physiology and hygiene.

A recent writer on education has well said : "Sedentary habits are the greatest enemy of the body; the greatest enemy of the mind is inattention. The ideal of the educator is to obtain from the child for a short period its whole attention, then to let it unbend and repair its expenditure." I wish every teacher would ponder well these words, for they contain a world of meaning.

The Dangers Arising from Taking Off the Hat Out of Doors During Funeral Services.¹

HE frequency of reported cases of severe illness, and sometimes death, traceable to the removal of the hat at funerals, has determined the California State Board of Health to address the reverend clergy and the officers of secret, fraternal and beneficiary societies throughout the State, respectfully directing their attention to the serious consequences which not infrequently follow the observance of the custom during the prevalence of inclement weather or under the rays of a hot summer sun.

The hat is used as a covering for the head. In an infinite variety of shapes and patterns the hat or cap has been worn from times of remote antiquity. In its various forms it has been known under different names, and adopted by some nations as a symbol. The most ancient form is the cap, such as is seen in figures representing the Goddess of Liberty. The Grecian *pileus* was a woollen cap sometimes worn as a lining to the helmet. The aged and infirm Romans wore caps of the same material for warmth. When conical, the cap was the *apex* of the Roman priests, worn probably from the time of Numa. With the elevated crest pointed forward, like the liberty cap, it was the Phrygian or Mysian bonnet. With a brim it became the *petasus*, a hat much like the round felt hats now worn. Among the Romans the cap was a

¹ Addressed to the clerical profession and officers of secret, fraternal and beneficial societies by the State Board of Health of California.

symbol of liberty, and slaves were presented with one on receiving their freedom. In modern times it has been a conspicuous article of dress, and has been adorned with showy plumes, jewels and rosettes. It has also been worn as a mark of authority, and its shape and ornamentation have frequently made it an insignia of rank and station. Its form, and sometimes its color, has been made to designate the rank and character of its wearer, as the monarch, by his crown; the cardinal, by his red hat, betokening his readiness to spill his blood for the sake of the Saviour; and the court fool, with his cap and a bell. In one form it serves to distinguish the military officer, and in another the peaceful Quaker. The wearing of a hat as an article of apparel is an almost universal custom. There must underlie the wearing of a covering for the head a deeper significance than a mere conformity with the prevailing fashion.

The spectacle of an adult person walking the streets or country roads, or laboring in the open air, without wearing a hat, would excite comment everywhere. Doubts of the mental soundness of the person would be freely expressed. The custom of hat-wearing arose from necessity. Every one will acknowledge the warmth and comfort of a fur or woollen cap or hat in cold and stormy weather. The fashion of wearing the hair short increases the need of an artificial protection to the head, while to those who are bald it is indispensable to the preservation of good bodily health. Nurses often find it necessary to put a flannel bonnet on the heads of young infants before they can be cured of cold in the head and nostrils. A foundation for chronic nasal catarrh is one of the results of repeated colds during infant and child life.

Not one man in a thousand goes out of doors ten minutes of the day without taking the precaution to put on a hat. Experience has taught him that a neglect to do so may bring on a fit of sneezing, a watery suffusion of the eyes, a sore throat, headache, earache, neuralgia, toothache and symptoms of a cold, with fever, a cough and, perhaps, pneumonia. So fully is this recognized in Europe that the custom of saluting ladies and friends by lifting the hat has been of late years greatly superseded by the wave of the hand, or half military salute.

Since the prevalence of la grippe, the outdoor exposure has multiplied. Many cases of severe illness, and not a few deaths, have been noted from this cause. The most common occasions of danger have been during attendance on funerals, either as pall-

bearers or mourners. In well-conducted funerals undertakers nowadays frequently furnish skull caps to be worn by pall-bearers. The skull cap, although it has no visor to protect the eyes, is nevertheless an efficient covering, does not offend our sensibilities, and implies no want of respect for the dead. The minister and the mourners may also be furnished with skull caps. There need be no discrimination in favor of the pall-bearers. But all reflecting persons will agree that it requires a stretch of the imagination to detect the difference in the effect between the wearing of an ordinary hat and the wearing of a skull cap on such occasions. Baring the head at funerals is a mere convention that serves no useful ceremonious purpose. Wearing a skull cap is no compromise; it is a surrender. The custom of taking off the hat in wet or cold and stormy weather while the remains are carried from the home to the hearse, or from the hearse to the chapel or lodge-room, and again when the last sad rites are performed at the grave, is fraught with danger. Ten, fifteen and twenty minutes are not infrequently consumed, during which pall-bearers and mourners remain uncovered, while a chill wind, laden with damp, diminishes the vital resistance of the weak, and lays the foundation for a decline. The recently sick, the aged and infirm, and those who have lost the hair of the head, are in the greatest danger. But none are exempt. There are but few who, in the absence of suggestion, will defy the almost universal custom of Christian nations to uncover in the presence of the dead. Their sentiments of love, honor and respect for the dead impel them to disregard the danger involved by the exposure, notwithstanding a full comprehension of its evil import.

It is on such occasions that the intelligent and masterful influence of the ministry and chief officers of lodges and societies having the burial in charge may be exercised in the beneficent advice to remain covered, and avoid discomfort and danger. This can be done with neither injury nor disrespect to the dead, but with great kindness and benefit to the living. Speaking with authority, and themselves setting the example by remaining covered, they administer comfort, relief and protection, and with certainty lessen apprehension for the results of the necessary exposure incidental to the interment.

A desire to live to a fullness of years is instinctive in all men. It is believed that the pursuance of the course herein indicated will not only be the means of preventing much sickness, but may

be the means of preserving many useful lives. That the effort to prevent disease shall at least equal, if it does not exceed, the art of cure, is one of the possible triumphs of modern civilization.

**The Dangers Arising from Public Funerals of Those
Who Have Died from Contagious and
Infectious Diseases.¹**



THE State Board of Health of California, realizing fully the benign influence of the reverend clergy of the State, and having a high appreciation of their functions as leaders and teachers of the people, would especially invoke their influence and co-operation in the instruction of the public in the principles of health and its preservation. Because of their general intelligence and widespread professional influence, they can exert greater *personal* influence than any other class or profession. Their visits are always missions of consolation and mercy. Unlike other professions, these duties are performed without fee or reward. There is thus engendered a confidential reverence for those so forgetful of self as to be ready at any and all times to speak words of hope, courage and trust when light has departed from the household, and despair sits perched upon the family altar.

It may be superfluous to call the attention of so intelligent a class of men to a subject on which nearly all may have formed well-defined opinions; but having in mind the closeness of the pastoral relation to human life, the social standing of families, and the reciprocal feeling among friends and neighbors, it is deemed necessary to reinforce their convictions of what it is proper to do, by the conversion of such convictions into custom and law.

The board, therefore, respectfully asks the attention of ministers of all denominations and of every order to the practice of holding public funerals of persons who have died of contagious or infectious diseases. In many cities and towns there exists a municipal regulation or ordinance prohibiting a public or church funeral of any person who has died of Asiatic cholera, smallpox, typhus fever, diphtheria, yellow fever, scarlet fever, or measles, and directing the family of the deceased to limit the attendance to as

¹ Addressed to the clerical profession by the State Board of Health of California.

few as possible, and to take all precautions to prevent the exposure of other persons to contagion or infection. The person authorizing the public notice of death is also required to publish the name of the disease which caused the death of the person whose funeral is to be held. Where such local regulations are in force the clergy are relieved from the painful duty of refusal to perform such services.

Many amiable and otherwise well-informed people will importune the minister to officiate at a public funeral of a precious child that has died of diphtheria or scarlet fever. They cannot or will not understand that a compliance with the request endangers not only the lives of those present, but the lives also of the children of the kind pastor, who would not inflict pain by refusing, and of the children of sorrowing friends who inspect the remains in the casket, and follow them to the grave. It is to prevent such consequences that the suggestion is made that those of the clergy who live in cities and towns should so use their influence with the municipal authorities as to induce them to adopt an ordinance restraining any one from officiating at a public funeral in case of death from contagious diseases.

It is believed that considerations of personal and public safety need not be urged in support of the vital necessity of such action when addressing the clerical profession. If it was necessary to cite authorities to convince them that contagious diseases may be communicated by exhalations from the bodies of the dead, as well as by contact with living persons afflicted with the disease, they could be furnished without number. This would be the universal testimony of medical men. But it is considered unnecessary to furnish and multiply instances of infection and fatal results arising from public funerals in the case of contagious diseases. The principal thing is to refuse to hold such public services, no matter what the social standing of the family of deceased may be. Objections may arise to what at first may appear to be an extreme course. There is planted deep in the human heart a desire to honor the dead, and there are unfortunately many who think this can best be shown by a public funeral. They believe that to neglect public funeral rites is to manifest a lack of proper regard for the memory of the dead.

At this moment, when an atmosphere of sorrow and gloom pervades the home, considerations of safety for the living are apt to be received with indifference and contempt. Whatever is said

to the bereaved relatives at such a time, must be spoken with the utmost gentleness. But they must be instructed as to the duty of subordinating their wish to honor the dead to the duty of preserving the health and lives of the living. It is believed that most persons will yield in this matter if properly advised. But if any are unreasonable, and insist upon public funeral rites with an apparent disregard for the safety of others, the public power of the municipality or the State should be invoked to teach such persons that it is a high moral duty to forego their preference, and to subordinate their individual desires, that the welfare of the community may be conserved. Fortunately, in California, sanitary legislation has been such as to invest cities, towns and sanitary districts with all the powers needed for the protection of their respective localities. But as all know, such laws depend in a great measure upon public opinion for their enforcement. The sentiment of the community must be taken into account, and as the affairs of funerals have been almost entirely delegated to the church, ministers of the Gospel stand in a position to explain to the people how it is possible to manifest proper and fitting respect for the dead without disregard for, and danger to, the living. Not only should it be explained that it may be contrary to law, but it is also thoughtless and selfish for the members of one family to insist that persons from many other homes shall be subjected to the danger of infection, in order that a public funeral service may be held over the unconscious remains of one who can neither be benefited by it nor injured by its omission. The clerical and medical professions agree on all important questions relating to the preservation of human life and the betterment of humanity. It is certainly desirable that the two professions that have to deal with the hopes and fears, the joys and sorrows, the life and death of mankind, as an inseparable function of their office, should enjoy each other's confidence and earnest co-operation in any measure calculated to ameliorate the condition of the human race.

A Royal Heart for Sale.

The heart of the French Dauphin, son of Louis XVI and Marie Antoinette, was removed at the autopsy ninety-seven years ago, and has been preserved in alcohol ever since. The heart was in the possession of Dr. Pelletan who performed the autopsy. His son having recently died, the specimen is to be sold at auction.

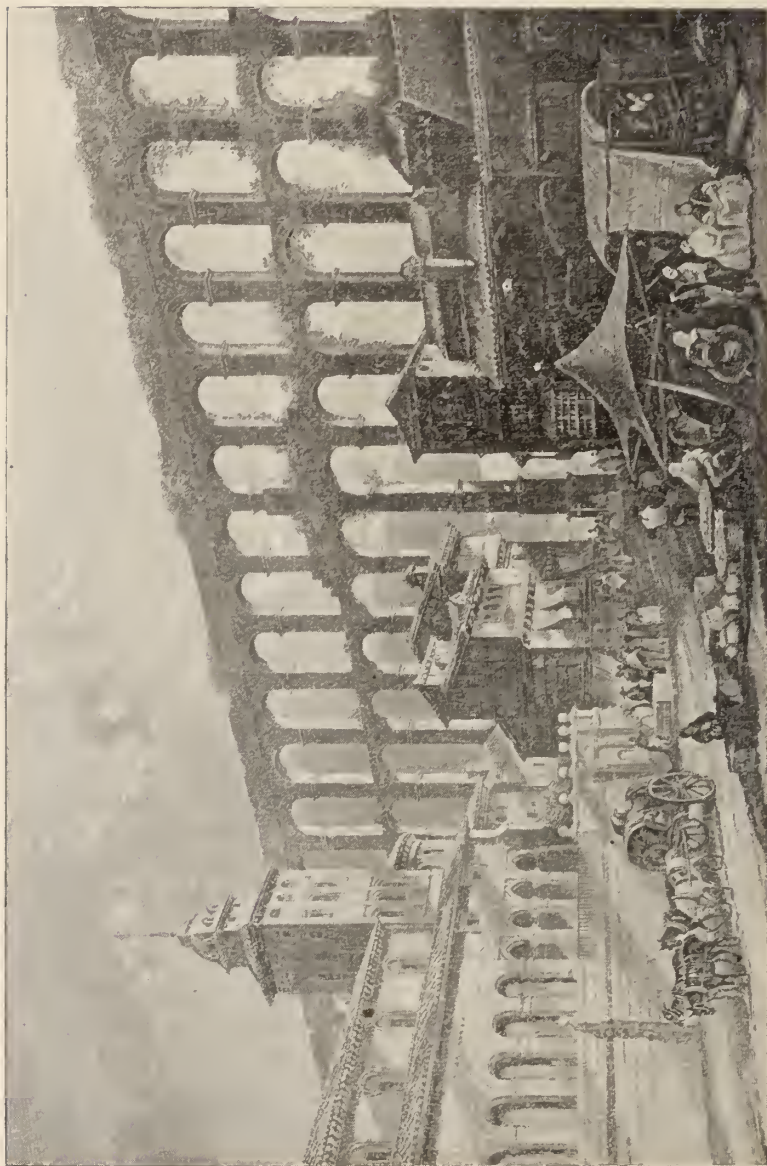
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Water.

IT MAY seem strange that we should feel called upon to write an editorial upon such a commonplace subject as water, but we are quite firmly convinced that the rôle which water plays in the economy of nature is not properly realized by the majority of mankind. We all know that water is necessary for life, and we all do a great deal of talking about the necessity of having pure water; thus far, theoretically; thus far, so far as talk is concerned, we seem to be right, but our practical actions do not accord with our theoretical talk, for it is but rarely that we find ourselves taking action to provide that bountiful supply of pure water which, in our talk, we admit and claim to be a prime necessity of community of life. We feel no hesitancy in asserting that impure water is responsible for much more ill health than the average individual ever dreams of. The nations of antiquity, and particularly the Romans, seem to have had a much better conception of the importance of pure water than is vouchsafed to humanity in this closing decade of the nineteenth century.

With the Tiber flowing through Rome, the Romans never thought of taking their water supply from this river, as we do in Philadelphia and as is done in so many other localities; expediency was not with them, as it seems to be with us, the prime consideration. Their first question was how and where can we get pure water? not what will be the easiest and cheapest way to get it? Deciding that from the far-off mountains the purest water was to be had, there they went for it regardless of expense or trouble; not only in Rome itself, but in all the provinces and dependencies of the Roman Empire.



THE RUINS OF A ROMAN AQUEDUCT AT SEGOVIA.

Certainly it does seem to one who reflects upon it that humanity is a very funny, contradictory, illy-reasoning, perverse and foolish organization. It is a fact that but few individual beings profit by the experience of others, each finding it necessary to learn for himself, by his own personal experience, but it would appear, strange as it may seem, that what is true of the individual is equally true of communities of individuals; we fail to profit by the experience of communities of individuals that have gone before. Two thousand years ago the cities of the Roman Empire were furnished with water in comparison with which the water that is consumed in the majority of our American cities is but liquid sewage. We of to-day are more barbarous in this respect than were our ancestors twenty centuries ago. Is it not outrageous, is it not disgusting, is it not humiliating, is it not too much to bear, is it not enough to incite revolution, when we reflect upon this fact? When we think of the enormous sums of money that are being continually expended in our large cities for any and every other purpose than that of a pure water supply does it not make us feel that the boasted civilization of the nineteenth century is but a poor imitation of that which made the "pure-water" Empire of Rome the mistress of the world? We might go on denouncing this evidence of barbarism for pages, yet we must rest content with firing the train of reflection on this subject that must be ignited by the contemplation of this noble remnant of Roman civilization which we find at Segovia.

Immunity of the Hamburg Breweries from Cholera.

Careful statistics collected by Dr. Weyl show that, among the 1837 persons employed in the breweries of Hamburg and its suburbs, Altona and Wandsbeck, only two persons died of cholera, a slightly greater percentage than one-tenth of one per cent. This is the more remarkable since many cases occurred in the families of these same workmen and in the parts of the city where cholera prevailed. Two causes for this exemption are suggested: First, that the drinking of beer saved these men from the pest-laden public water supply; second, that the slightly acid beer destroyed the cholera bacillus, and thus served as a prophylactic.—*Sanitary Inspector.*



Dead Body Preserved for Sixty Years.

In distributing some bodies buried sixty years ago on a farm near Louisville, Ky., to reinter them in a city cemetery, a child's metallic casket was unearthed. The lid was removed and a child was disclosed looking as if it was just asleep. It was not petrified, and the cheeks bore the "flesh" color, the hair was natural and the white shroud was in a perfect state of preservation. Pinned on the right breast was a half-blown yellow rose, plucked from the bush.

Curiosities of Tinned Fruits.

A correspondent has submitted to us for examination a living creature which he states was obtained from the inside of a tinned pineapple. The fruit had been boiled at Singapore previously to tinning it, and was then imported to this country. On the tin being opened our correspondent was somewhat surprised to find a living insect, of strange and unknown appearance, inhabiting the inside of the pineapple. On examining the insect we found it to be the larva of some beetle the species of which could not be accurately ascertained; consequently it was impossible to say with certainty whether its natural food was vegetable or animal material. It is quite possible, however, that the statement of our correspondent regarding the cooking of the pineapple may be correct; for the fruit might have been imperfectly or incompletely cooked. In that case the temperature of the interior might never have reached so high a degree as to cause coagulation of the living tissues or of the structure of the egg or larva. The power of many insects and mites to resist both high temperatures and the action of many poisons is well known and exceedingly remarkable. Thus, the seed of the *nux vomica*, deadly to most animals, forms the appropriate food of certain beetles. Goats, again, are well known to have no special aversion to *hyoscyamus* as an article of diet. There is, of course, always the possibility of error of observation and of the introduction of the insect after the fruit has undergone the process of preservation.—*Lancet*.

Breathing Exercises.

Breathing exercises are of great value, most easily practiced, and give excellent results. It is not necessary to have an elaborate system. The nostrils are the proper organs of breathing. Man, unlike some other animals, is capable of breathing through the mouth if the nostrils are obstructed, and many from habit or debility continually do so—a practice, whether by day or by night, attended with many evils; whereas every breath of pure air a man inhales through his nostrils is a breath of life.

One exercise, repeated fifty or a hundred times a day, requiring no more than ten minutes all together, is of the greatest advantage and can be done out of doors as well as in, at almost every season of the year. It consists in inhaling through the nostrils a deep breath, retaining it a few seconds, and then, with the lips adjusted as if one intended to whistle, expelling it slowly through the contracted orifice. There is no physiological objection to exhaling through the mouth; there are no muscles whereby the course of the breath can be restrained through the nostrils; but the lips contain sufficient muscular strength for this purpose. If students would rise from their studies, book-keepers from their desks, women from their sewing or reading, two or three times a day, and take from fifteen to thirty such breaths, the results would surprise them.—Dr. J. M. Buckley, in *The Chautauquan*.

Sea-Sickness.

Dr. Thomas Dutton, in his little book (third edition, London, 1892), acknowledges that there is no absolute specific for sea-sickness, but claims great advantages from the preparatory treatment, consisting of a restricted diet for fourteen days, a laxative pill, saline water before breakfast, and bromide of ammonium three times a day. The preliminary diet for an invalid should be chiefly of bovine, tea made specially, and hard biscuits. Dr. Dutton advises the voyager to have his own tea made by allowing boiling-hot water to remain on the leaves only four minutes. In the acute stages of sea-sickness, one drop of pure chloroform in two ounces of Seltzer-water every half hour and a mustard-plaster placed over the gastric region for fifteen minutes, are found to give the best results. Champagne is to be given only in the later stages, for the depression. Gingerale is advised; bottled stout is condemned.

“Why Wear a Hat?”

Perhaps no article of clothing has been more freely criticized in respect of its utility than that which lexicographers describe as a “covering for the head.” Some, instructed by the example of savage races and of others widely different in various ways, among them the leaders of feminine fashion, whose crowns of gossamer may practically be disregarded, would have it that the hatless condition is that most characteristic of mankind. Against their opinion we find arrayed the combined force of civilized usage in every climate. From pole to pole we find that man, if he dresses at all, dresses his head. Even if bootless and guiltless of such minor trifles as waistcoat and collar, he covers the head with some form of clothing. Nay, the very savage, though he may know nothing of silk or felt, will often so decorate his vertex with feathers, or so weave its own natural wool, that not even the conventional European cylinder could protect it more effectually. Surely there must be reason in all this. There is a clearly conscious need which exists not merely in the imagination. It is thus practically admitted that though the head, like any other part of the body, may, after having suffered the attrition of atmospheric variations, become innured to their action, it still loses somewhat in the process. In the first place, it is evident that in this conflict only the fittest can hope to survive. Civilized man will not endanger his chance of survival by risking the experiment. Further, he finds that the inferior animals thus exposed undergo external changes which do not often, if ever, tend in the direction of refinement, and instinctively he shuns the possible return to coarseness and barbarism. He also recognizes the fact that, given a wholesome custom in head clothing, the consequent effect will be as healthy as it is becoming. Foremost among the sanitary principles which ought to control usage in this matter are two—the avoidance of any but the lightest pressure, and the admission through the texture worn, or by special apertures, of sufficient air for free ventilation of the head. If these elementary considerations be duly regarded, and sufficient protection be provided against changes of weather, we shall find man the better, not the worse, for wearing his “covering for the head.”—*Lancet*.

In severe paroxysms of coughing from whatever cause, a tablespoonful of glycerin in hot milk or cream will give speedy relief.

Obstetrical Science and Architecture.

In the northwestern part of New York City are two maternity hospitals; one, the Sloane, is a model of all that a maternity hospital should be, and is fully equipped with everything that obstetrical science could possibly require. The other, the New York Infant Asylum, is an aged, wretched, ill-ventilated, badly-plumbed wooden building, reeking with sewer gas, and threatening at any time to fall into the street. It has not even a pair of obstetrical forceps which can be called its own. Yet, in the past few years there have been delivered in each hospital 1000 consecutive cases of midwifery, with only, in each series, three deaths. The results have been obtained, of course, only by great watchfulness and careful antisepsis. But they show that architecture and elaborate appliances are not absolutely essential to successful work, and that the man is greater than his environment.—*Med. Record*.

"L'estomac et le Corset."

Dr. Chapotot, in a recent essay published by Baillière under this title, gives a fair summary of the opinions of experts such as Bouvier, Dickinson, Sibson and others, on the real and imaginary evils attributed to constriction of the waist. The question of the true position of the stomach is very important in respect to the correct interpretation of abnormal relations of the abdominal viscera detected after death. The most original portion of Dr. Chapotot's essay refers to a matter of some interest to ladies. Young women have often reason to complain of disagreeable noises caused by air moving about in the epigastric region. Our author attributes these noises, which differ from borborygmi, to a vertical bilobulation of the stomach caused by the pressure of stays. During expiration the upper lobe is relieved of pressure by the ascent of the diaphragm. The lower lobe is, on the other hand, subjected to great pressure from the abdominal muscles. Hence air and liquids are forced upward into the upper lobe through the narrow isthmus produced by the pressure of the stays; as they pass through the isthmus and issue out of it the characteristic gurgling sound is produced. If the stays be taken off the sounds are no longer heard, but they can be reproduced by applying any other form of constriction to the abdomen at the same level.—*British Medical Journal*.

Prevention of Lead Poisoning Among Glass Polishers.

Lead poisoning among glass polishers, due to the tin putty employed, may, according to M. Guérout, be entirely abolished by a new plan which has for the last eighteen months been adopted at the Baccarat Glass Works. The old tin putty that was used was a stannate of lead which was manufactured in special furnaces by oxidizing three parts of lead with one part of tin. In the new material two parts of metastannic acid are added for each part of putty, the lead being reduced to about a third of the old proportion. Under the former system numbers of workmen suffered from lead paralysis, and many had to leave the works entirely. Since the introduction of the metastannic acid putty, however, not a single case of lead poisoning has occurred.

Fashionable Sweepers.

A prominent physician, who gives close attention to bacteriological study, says: "Lately the long dress trains worn in the streets by our ladies suggest another way to carry tubercle and other bacilli into our houses. In walking along the streets we constantly see a dress wipe up portions of sputum from the pavements. From one of these dresses dragged over the streets a few times I was able to demonstrate the presence of seven tubercle bacilli on an inch microscopic slide on which a little dirt off a dress was dusted. Knowing, therefore, that these long dresses have dried tuberculous sputum on them for the maids to dust off in our ladies' dressing-rooms, most of which are poorly ventilated, we can quite understand how a sufficient number of bacilli can be collected in small compartments to an extent dangerous to at least those predisposed to tuberculosis."

Dr. Holmes on Dragging Skirts.

Dr. O. W. Holmes, in his "Professor at the Breakfast Table," puts the following language respecting dragging skirts into the mouth of one of his characters:

"The Little Gentleman began: Our landlady's daughter is a young lady of some pretensions to gentility. She wears her trains very long, as the great ladies do in Europe. To be sure, their dresses are so made only to sweep the tapestried floors of chateaus and palaces, as those odious aristocrats of the other side

do not go dragging through the mud in silks and satins, but, forsooth, must ride in coaches when they are in full dress. It is true that, considering various habits of the American people, also the little accidents which the best-kept sidewalks are liable to, a lady who has swept a mile of them is not exactly in such a condition that one would care to be her neighbor. Why, there isn't a beast or a bird that would drag its tail through the dirt in the way these creatures do their dresses!

"Because a queen or a duchess wears long robes on great occasions, a maid-of-all-work or a factory girl thinks she must make herself a nuisance by trailing through the street, picking up and carrying about with her—pah! That's what I call getting vulgarity into your bones and marrow. If any man can walk behind one of these women, and see what she rakes up as she goes, and not feel squeamish, he has got a tough stomach. I would not let one of them into my room without serving them as David served Saul at the cave in the wilderness—cut off his skirts, sir, cut off his skirts! . . . Don't tell me that a true lady ever sacrifices the duty of keeping all about her sweet and clean to the wish of making a vulgar show. There are some things that no fashion has any right to touch, and cleanliness is one of these things."

Filth and the Death-Rate.

The season is at hand when sanitary officers should be active. The prolonged winter weather, and especially the excessive amount of snow which has covered the ground for so many weeks, has tended strongly to impede travel except in beaten tracks, and has doubtless resulted in a vastly greater accumulation of refuse and waste material about our homes than usual. So long as this is frozen the processes of decomposition and putrefaction are delayed or arrested, and the development of pathogenic germs is hindered. But with the warmer temperature of the vernal suns, these processes promptly begin, and contemporaneously with the bursting forth of vegetation will be the bursting forth of such putrefactive products as the masses of animal and vegetable filth in our cellars and back yards may originate. The Sanitary Inspector should soon go upon duty. Let every householder anticipate his visit, and by the thorough removal of all accumulations of filth of every sort, make ready to give him a defiant but respectful and welcome reception.

"Filth and the Death-Rate" was the somewhat startling heading of an article in a New York daily paper recently, in which was attempted to show that the very high death-rate in New York City during February was largely due to the great accumulation of filth in the streets during the snow blockade. No fact in sanitary science is better established than the close relationship of filth to the death-rate.

The wise and the prudent will take note, and without needless delay proceed with intelligent energy to put their premises and surroundings in that condition which is said to be next to godliness. This is sometimes called "preventive medicine." It is far more certain and effective in preventing diseases than any in the apothecary's shop will be in curing it, and vastly less expensive.

All the sanitary prophets agree in predicting the advent of cholera during the coming summer. All past experience goes to show that the spread of cholera after its introduction into a community is, says Dr. Shakespeare, "universally associated with contaminated water supply, filthy habits and bad personal and domestic hygiene." Self-protection then, if no higher motive exists, should prompt every one and his neighbors to clean up thoroughly and to keep clean. Every Board of Health in Connecticut should have their Sanitary Inspectors promptly on duty as soon as the snow is gone, to seek the breeding places of disease and have them routed and exterminated before the warm weather begins.—*Bull. Conn. State Board of Health.*

Beneficial Influences of Snow.

The *New York Medical Journal*, December 31, 1892, shows that snow exerts a beneficial influence on the nerves, impressing us in a peculiarly grateful way after a spell of murky or foggy weather. It is helpful, also, for it ekes out the daylight and assists the belated traveler along roads that are overshadowed by woods.

A snowfall is as benign as it is beautifying during these days of the minimum of sunshine. During these dark days of the winter solstice the glitter of the snow most happily compensates for the paucity of sunlight, and has an added hygienic value in cleansing a foggy and dust-laden atmosphere, second only to a vigorous rainfall in its purifying and ozonizing power.

Spurious Vaccination in Belgium.

At a recent meeting of the Belgian Medical Federation Dr. Wibo gave an account of a strange kind of vaccination in vogue among the inhabitants of certain villages. The child is "vaccinated" in the usual situation with a needle which is charged by being previously inserted into one of the pustules which occur in pigeons in summer, which are vulgarly looked upon as small-pox pustules, but which are in reality produced by mosquito bites. Of course, this vaccination is absolutely useless as a prophylactic against smallpox, but it gives rise to cicatrices which at first sight may be readily mistaken for those of true vaccination. The false scars are, however, distinguishable from the true by being quite flat and not swollen or raised. They resemble, in fact, the scars following very superficial ulcers.

Night Air.

Before we can hope to fight consumption with any chance of success we have to get rid of the *night-air superstition*. Like the dread of cold water, raw fruit, etc., it is founded on mistrust of our instincts. It is probably the most prolific single cause of impaired health, even among the civilized nations of our enlightened age, though its absurdity rivals the grossest delusions of the witchcraft era. The subjection of holy reason to hearsays could hardly go further. "Beware of the night wind; be sure and close your windows after dark!" In other words, "Beware of God's free air; be sure and infect your lungs with the stagnant, azotized and offensive atmosphere of your bedroom." In other words, "Beware of the rock-spring; stick to sewage."

Is night air injurious? Since the day of creation that air has been breathed with impunity by millions of different animals—tender, delicate creatures, some of them—fawns, lambs and young birds. The moist night air of the tropical forests is breathed with impunity by our next relatives, the anthropoid apes—the same apes that soon perish with consumption in the close though generally well-warmed atmosphere of our northern menageries. Thousands of soldiers, hunters and lumbermen sleep every night in tents and open sheds without the least injurious consequences. Men in the last stage of consumption have recovered by adopting a semi-savage mode of life, and camping outdoors in all but the stormiest nights. Is it the draught you fear or the contrast of temperature? Blacksmiths and railroad conductors seem to thrive under such influences.—*Good Health*.



**State Board of Health and Vital Statistics of the
Commonwealth of Pennsylvania.**

PRESIDENT,

HON. SAMUEL T. DAVIS, M.D., of Lancaster.

SECRETARY,

BENJAMIN LEE, M.D., of Philadelphia.

PEMBERTON DUDLEY, M.D., of Philadelphia.

J. F. EDWARDS, M.D., of Philadelphia.

GEORGE G. GROFF, M.D., of Lewisburg.

J. H. McCLELLAND, M.D., of Pittsburg.

S. T. DAVIS, M.D., of Lancaster.

HOWARD MURPHY, C.E., of Philadelphia.

BENJAMIN LEE, M.D., of Philadelphia.

PLACE OF MEETING,

Supreme Court Room, State Capitol, Harrisburg, unless otherwise ordered.

TIME OF MEETING,

Second Thursday in May, July and November.

**Eighth Annual Report of the Secretary,
Benjamin Lee, M.D.**

CONTINUED FROM PAGE 261.

The appointment of deputy inspectors at such points as circumstances might, in the judgment of the Secretary, render necessary to serve during the emergency without compensation, was also authorized. The day following this meeting, Sunday, September 4, the Secretary conferred with His Excellency, the Governor, at Harrisburg, at the request of the latter, and laid before him the work of the Board. As a result of this interview His Excellency at once issued the following proclamation:

IN THE NAME AND BY AUTHORITY OF THE COMMONWEALTH
OF PENNSYLVANIA.

Executive Department.

Proclamation.

Whereas, Asiatic cholera is known to prevail in a virulent form in many foreign ports and countries with which this country is in constant communication;

And Whereas, The President of the United States has considered it expedient to issue a proclamation declaring quarantine against this disease;

And Whereas, The State Board of Health of this Commonwealth has, in view of the facts above rehearsed, issued the following circulars and orders, to wit:

A circular of instructions to all health officers, boards of health and borough councils, urging that unusual vigilance be exercised in carrying out all measures of sanitary precautions as set forth in Circular No. 7 of said Board, entitled "Precautions Against Cholera, Cholera Morbus," etc.;

A notice to all officers of transportation companies, whether by land or water, to the effect that if such companies introduce cholera into the State, they will be declared contraband of quarantine, and their conveyances subject to detention at the State line and inspection by an inspector of the board;

A circular of instructions to officers and employés of railroad and navigation companies, indicating certain additional precautions necessary to be adopted in order to maintain their roadways, waterways, conveyances and stations in a condition of cleanliness and purity; and an order declaring a quarantine of twenty days of all vessels coming from infected ports at all ports of entry in this Commonwealth;

And Whereas, The local boards of health and municipal authorities of many cities and boroughs have issued circulars of information, and adopted stringent rules and regulations for placing their respective towns in the best possible sanitary conditions;

And Whereas, The history of all epidemics of this disease, and the accurate knowledge now possessed of the habits and mode of propagation of the germ which causes it, renders it absolutely certain that it cannot become epidemic in a community in which the laws of personal hygiene and scrupulous cleanliness of habitations, premises, streets and neighborhoods are carefully observed and enforced;

Now, therefore, I, Robert E. Pattison, Governor of the State of Pennsylvania, do recommend to all authorities charged by law with the protection of the health and lives of their respective communities, whether boards or bureaus of health, health officers, health commissioners or borough councils, the utmost promptness and energy in placing their towns in a state of sanitary defense in accordance with the instructions of the State Board of Health, and to the citizens of such towns that they not only yield cheerful obedience to the orders of such authorities, but lend their active aid in enforcing the same.

To the residents of villages and townships which are not provided by law with health authorities, that they voluntarily unite in appointing sanitary committees, composed of the most influential and intelligent members of the community, charged with the duty of making inspections, removing accumulations of filth, providing depots of disinfectants, and in all other known ways promoting sanitary conditions.

To physicians and others concerned in attendance on the sick, that they at once report any suspicious case of which they may have knowledge to the local authorities or to the State Board of Health, without any attempt at concealment, which is the surest means of spreading contagion; and to all transportation companies that they at once comply with the instructions of the State Board of Health.

Given under my hand and the great seal of the State this fifth day of September, in the year of our Lord one thousand eight hundred and ninety-two, and of the Commonwealth the one hundred and seventh.

By the Governor,

ROBERT E. PATTISON.

WILLIAM F. HARRITY,

Secretary of the Commonwealth.

The issue of the proclamation, together with the circular of the board to local authorities, had a marked effect. In all incorporated towns sanitary work was vigorously prosecuted. As soon as it was understood that deputy inspectors would be appointed for unincorporated villages and townships, requests began to pour in for such appointments, indicating that while the people were anxious to carry out the instructions thus given, they felt themselves powerless in the absence of some one with authority to direct their efforts and enforce precautions on the unwilling. Such appointments have been made to the number of thirty, covering points in every section of the State. In several instances, in view of the tendency of parties who have been guilty of maintaining nuisances in cities to remove the same to points directly outside the city limits, as well as the likelihood of accumulations of filth of all kinds to take place in such localities, it has been thought expedient to confer this authority upon the health officer or secretary of the board of health of the city.

The following circular defines the duties of such officers:

DUTIES OF DEPUTY INSPECTORS TO THE STATE BOARD OF HEALTH
OF PENNSYLVANIA.

Deputy inspectors are appointed in order to meet the emergency now confronting this board in view of the threatened invasion of cholera, and of the entire absence of local health officers in this State, outside the limits of large cities and towns. Their duties are, therefore, those ordinarily appertaining to the position of a local health officer, as follows:

First.—Should any incorporated borough exist within the limits of their respective districts, to notify the burgess and council of such borough that they are by law responsible for the protection of the health of the people, and that failure to carry out the instructions of the State Board of Health recently issued for placing their towns in the best possible sanitary condition, will render them liable to impeachment and prosecution as officers, and to a fine of one hundred dollars as individuals.

Second.—In every village, to urge the residents thereof to unite in mass meeting and appoint the following committees, viz.: a finance committee, a sanitary committee and a quarantine committee. The finance committee to be charged with the duty of raising and disbursing funds; the sanitary committee with that of inspection, cleaning up, disinfecting and draining all streets, roads, alleys and commons, of inspecting private properties, and insisting on similar steps being taken by their owners or occupants, and of establishing depots for disinfectants and instructing the people in their use; and the quarantine committee, with that of inspecting all strangers arriving in the village, ascertaining whether they have come from infected places, keeping them under observation for five days, and should signs of cholera appear among them at once removing those attacked to some place already determined upon by the committee, and there keeping them in strict quarantine with day and night guards until the deputy inspector and attending physician pronounce them free from the danger of conveying the infection. Acting in conjunction with the county commissioners and poor directors they shall provide medical and nursing care and food for all persons thus detained.

Third.—To make frequent personal inspection of their respective sub-districts, and especially of all places of which complaint shall be made to them, and in case such places in their opinion be in such condition as to endanger the public health, to declare the same nuisances, and to order their abatement in the name of the State Board of Health without waiting for further instruction; and in case the parties so notified refuse to obey such orders within a reasonable number of hours, to report their names, with a full statement of the facts of the case, to the Secretary of this board, in order that the district attorney may be instructed to bring suit against the offenders in the name of the State.

Fourth.—To make frequent report in writing to the medical inspector of the board for the district in which their sub-districts may be situated, of the general sanitary condition of the same, of nuisances needing abatement and nuisances abated and work done, and to give the Secretary of the board immediate notice by telegraph of the occurrence of any case presenting the symptoms of cholera within their jurisdiction.

Fifth.—To make themselves familiar with the model ordinance of the board and its circular on cholera, to distribute the same among the people, and in every way to instruct them as to their duties in maintaining their home in a cleanly condition and destroying all germ nests and plague spots in or near the same.

BENJAMIN LEE, M.D.,
Secretary and Executive Officer.

During the week following, the situation rapidly assumed greater gravity. Cholera-infected vessels began to arrive: deaths took place in New York harbor, the accommodations were evidently insufficient for the immense numbers detained under suspicion, cases of the disease appeared in the city of New York, and public apprehension all over this State became intensely aroused. On the ninth day of September a conference was held at the office of the Board of Health of Philadelphia, between that board, the State officials of the port, your Secretary and representatives of the principal railroads, to consider the situation and devise means for fighting the disease. The measure of railroad inspection was considered and met with cordial approval. The Secretary took occasion to call the attention of the railroad officials present to the Governor's proclamation as supporting the orders of the board already issued to them. At the request of the Secretary of the State Board of Health of Ohio, the Secretary met that officer and the secretary of the West Virginia Board at Pittsburgh, September 11, to consider the best means for preventing the spread of the disease through the medium of the railroads. As the mayor of that city had been in correspondence with the Secretary on the same subject, he invited him and such prominent officials as he might approve to be present. The whole subject was thoroughly discussed, and it was decided that the readiest means of meeting the danger was the placing of medical inspectors on trains, the furnishing of each immigrant or other suspected passenger with a certificate by the inspection officer at the port of entry and the endorsing of such certificate by the State medical inspector on crossing the State line. This, of course, meant the immediate outlay of money, and your Secretary was compelled to acknowledge that the board had none beyond what was required for its current

expenses. Before the close of the meeting a resolution was offered requesting the Governor to place the sum of \$50,000 at the disposal of the State Board of Health to meet the existing emergency.

While in Pittsburgh the Secretary, in company with his Honor the Mayor of Allegheny City, made a brief inspection of the Allegheny River in the neighborhood of the intake of the water works of that city. The water was found subject to much pollution of a serious character which, coupled with its sluggish flow, made it admirably adapted for the breeding of disease germs, and in view of the possibility of its contamination with those of cholera, the Secretary deemed it his duty to address a letter to the mayor of the city strongly urging the removal of the intake to a point higher up the river at the earliest possible day.

Returning to Harrisburg, the Secretary conferred with Mr. I. B. Brown, Deputy Secretary of Internal Affairs, with reference to the points on the State borders at which cholera would be most likely to be introduced by immigrants, and the stations or centres of population on both sides of the line nearest such points, and with the chief clerk of the Adjutant-General's Department as to the capacity and readiness of that department to furnish tents and camp equipage at a moment's notice.

The following letter accompanied the circulars of instruction and the Governor's proclamation sent to all railroad companies carrying passengers in the State :

COMMONWEALTH OF PENNSYLVANIA.

STATE BOARD OF HEALTH,

Executive Office, 1532 Pine Street,

Philadelphia,

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To the President and Board of Managers of the . . . Company.

GENTLEMEN: Allow me to call your attention to the enclosed order and circular of the State Board of Health, and to the proclamation of His Excellency the Governor of the Commonwealth, endorsing them.

You cannot too promptly inaugurate measures for complying with them, as cholera may at any moment slip through the sanitary cordon on the coast. The pecuniary loss which you would suffer should it become epidemic would infinitely outweigh the trifling expense of taking the prescribed precautions. The board looks confidently for the same hearty co-operation on your part with its efforts to protect the public health which it has enjoyed on previous occasions of less urgency and gravity.

I have the honor to be, gentlemen,

Yours with great respect,

(Signed) BENJAMIN LEE, Secretary and Executive Officer.

September 5th, 1892.

Replies to the above were received from the officers of all roads of any importance.

At the same time the following instructions were sent to all medical inspectors of the board whose districts bordered on other States :

COMMONWEALTH OF PENNSYLVANIA.

STATE BOARD OF HEALTH,

Executive Office, 1532 Pine Street,
Philadelphia, Sept. . . . , 1892.

Dr.
Medical Inspector,
. District.

DEAR DOCTOR: Within your district are the following points on the State border at or near which it may become expedient to establish inspection stations, hospitals and camps of observation, in consequence of the threatened invasion of cholera, viz., ... County, at which the R. R. enters the State, and the nearest important station to which across the border is

You are hereby instructed to at once confer with the officers of said road with reference to the most available locations for such stations, the most convenient points for instituting inspections of passengers, and the number of medical train inspectors which will be needed in order to ensure the protection of the State, and at the same time interfere as little as possible with the movement of trains and the convenience of the traveling public. In selecting points for camps you should have regard to isolation, facilities for drainage and water supply. You will also nominate to the board such physicians of experience and good standing as in your judgment will be qualified to perform the duties of train inspectors.

Yours very truly,
(Signed) BENJAMIN LEE, Secretary.

The following is the syllabus proposed by Dr. William H. Ford, president of the Board of Health of Philadelphia, of restrictive measures in the way of railroad inspection:

"Inspection of passengers, cars, etc., by skilled officers for the purpose of detecting diseases. A sanitary officer to be placed on every immigrant train in order to have full knowledge and control. Stations should be erected at convenient places for side-tracking cars in which sickness occurs. The cars to be fumigated, disinfected and thoroughly purified in all particulars at such stations. Prompt notice sent to hospitals to transport sick. Water supply and vehicles changed and disinfected. Infected cars with patients detached and hauled to these stations. Places for disinfecting baggage, clothing, etc., of suspects.

HANDLING OF IMMIGRANT TRAINS.

(2) Immigrant trains to be special trains, and detained until satisfactory inspection has been made. Health authorities to be notified in advance of the coming of such trains. Certificates of the health of each immigrant to accompany them on the trains, and to be certified to by the proper officer.

(3) Circulars of instructions issued.

(4) Immediate telegraphic notice to health officer when suspicious illness occurs on trains, and such cars side-tracked at appointed stations until visited, inspected and disposed of by sanitary officer.

(5) Stations convenient for the railroads and health authorities to be selected near the terminals for the conduct of inspection, disinfection, etc.

On the 14th day of September, immediately on his return from Harrisburg, the Secretary, in company with the Committee of the National Conference of State Boards of Health on Quarantine Inspection, the Mayor, the Director of Public Safety, the Board of Health and the Port Physician of Philadelphia, made careful inspection of the plant of the Lazaretto, including the remodeled steamer "Georgeanna," designed for the detention and disinfection of suspects and baggage.

The committee referred to consisted of the secretaries of the State Boards of Health of Kentucky, Michigan and New Hampshire, and of the Provincial Boards of Health of Ontario, Canada, one of the members being also the Secretary of the American Public Health Association. They thus represented fairly the opinion of practical sanitarians over the whole continent, and were unanimously in favor of a general system of railroad inspection at State borders.

It was a matter of congratulation to the Secretary and to the Philadelphia board that the commission was able to express itself in a very complimentary way as to the forwardness of the preparations made at this port for treating both immigrants and their effects.

Meantime the conditions became daily more alarming, so that it was deemed wise to call a meeting of the Committee on Sanitary Supervision of Travel and Traffic for Friday, the 16th, summoning the officers of the more important railroads to appear before the committee and state what steps were being taken in accordance with the instructions of the board and the recommendations of the proclamation, and also to furnish the committee information as to appropriate sites, just within the State border, for the establishment of camps of detention, should the necessity for them arise.

This conference was attended by representatives of the three principal trunk lines operating in the State, by Dr. William H. Ford, president of the Philadelphia Board of Health, Dr. Henry Leffman, chemist to the board, Dr. William B. Atkinson, medical inspector of the Delaware District, and Dr. Charles M'Intire, medical inspector of the Lehigh District.

Much valuable information was furnished by the railroad officers, who pledged their companies to the fullest co-operation with the board in its proposed system of immigrant inspection on trains, suggesting, however, that the inspection should commence as far from the State line as possible in order to diminish interference with the movement of trains.

As there were members of the board present to form a quorum, on the close of the conference the board organized and a meeting was held, at which it was deemed advisable to request a conference with leading citizens of Philadelphia, at the mayor's office, in order to take counsel as to the proper course to pursue in order to raise funds. This conference, which took place on Wednesday, September 21, was attended by the Citizens' Relief Committee of Philadelphia, the president of the Board of Health of Philadelphia, the port physician and members of our own board, and was presided over by His Honor the Mayor. The measure of railroad inspection as a protection to the entire State was strongly urged by Dr. Shakespeare, the port physician. It was the sense of this conference that the Chief Executive of the State was the only authority by whom money could be

borrowed for State uses should the necessity for obtaining it arise in the interval between sessions of the legislature.

An interview with His Excellency the Governor was accordingly requested, and took place the day following. The subject was discussed in all its aspects, and it was decided that the Secretary should keep the Governor informed of the situation, and of such unusual expenses as the same made necessary, which he on his part would hold himself in readiness to meet.

While indebtedness has been incurred, especially to its own medical inspectors, there has not yet been the absolute necessity for direct outlay such as would call for the proposed application. The efficient measures adopted by the Federal Government to check and, indeed, temporarily prohibit immigration, have so diminished the present urgency of the situation that it is now probable that no such call will need to be made before the session of the legislature.

The idea of railroad inspection, as one means of checking the advance of epidemics, is no new one.

So clearly did the board see its duty with regard to this question of limiting the progress of epidemic diseases, that at its very first meeting, July 2, 1885, it adopted the following resolution, namely:

"Resolved, That the Secretary be instructed to communicate with the secretaries of the State Boards of Health of all contiguous States with reference to devising a plan of interstate supervision of travel and traffic, in order to prevent the importation of infected goods or persons from one State into another."

Such conferences have been held from time to time, the last having taken place at Pittsburg on the 11th day of the present month, as above stated, while each year the secretaries and delegates of all the State Boards of Health of this continent meet in general conference to discuss this and other questions of official administration. There is, therefore, a uniform plan of action adopted for the entire country, which greatly facilitates the object in view, namely, the most complete limitation of epidemic disease with the least possible interference with travel and traffic. This plan contemplates the inspection of moving trains coming from infected places, or suspected of transporting infected persons or goods, by competent physicians; the instant removal and isolation of any found to be affected with contagious disease; and the furnishing of such passengers as are considered to be free from the danger of carrying the infection with a certificate to that effect. The formal regulation authorizing the Secretary to institute such inspections and isolate such passengers, on which the order of the board to transportation companies was based, was adopted by the board during the first six months of its existence. It will be found upon page 320 of the First Annual Report of the board.

This system has received the endorsement of the most eminent practical sanitarians, and has been already in successful operation in several States of the Union. Its introduction will necessarily entail considerable expense. The inspectors must be intelligent, well-educated physicians, of such age, standing, practical experience and knowledge of affairs to command general respect. Their number must be sufficient to enable them to do their work thoroughly without serious interference with travel and traffic.

[TO BE CONTINUED].



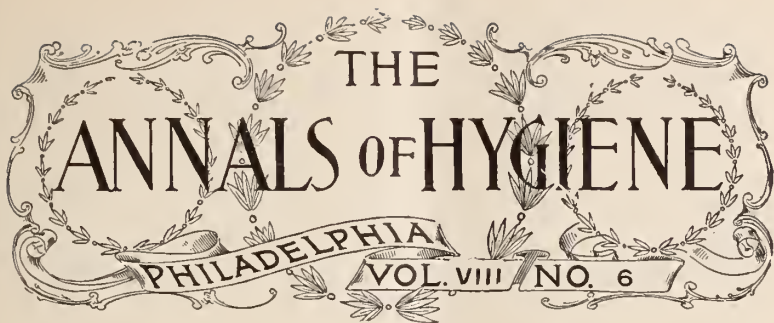
This department is designed for the description of improved Sanitary Appliances and Medicinal Preparations introduced by patrons of The Annals. The matter is not paid for, nor can it be classed as advertising. But as the information is necessarily obtained from those who offer the appliances for sale, it is proper to say that the manufacturers, rather than ourselves, are responsible for the statements made.

Sulfonal.

SULFONAL, since its advent into therapeutics, has been found to fulfill all the qualifications of a safe, reliable and efficient hypnotic and antispasmodic. It fills a long-felt want in this land of brain-workers, where insomnia is one of the most common conditions which the physician is called upon to treat. Unlike other hypnotics, sulfonal, when administered in moderate doses, has no injurious effects on the circulation, respiration, digestion, temperature and general health, and even excessive doses have given rise to only temporary disturbances. Sulfonal is considered the most safe and satisfactory drug for combating insanity, and the most valuable remedy yet discovered to control insomnia in the morphia habit. Its advantages over other hypnotics are that it does not constipate as do the preparations of opium; the sleep produced by it seems to more closely resemble natural sleep than does that of any other drug; and having neither taste nor odor, it is easily given in cases where patients object to taking medicine. Sulfonal has proved the most successful of the hypnotic group, being especially beneficial in cases of delirium tremens and asthma, and it has been found valuable in children, in quieting the irritability of teething, preventing convulsions and producing peaceful sleep. Sulfonal is recommended in twenty-five-grain doses at bed time in cases of insomnia in the opium habit, and cases are reported in which its use gave very favorable results. At the meeting of the American Medical Association, in June, 1892, several physicians related their experiences with the remedy in controlling the cramps of fractured limbs and other reflex spasms, such as obstinate hiccough, and bore testimony as to its general value as an antispasmodic. In various affections, such as chorea, epilepsy, tetanus neonatorum, excellent result has been obtained from Sulfonal. As a sleep-producer after surgical operations, this drug has been used in place of morphia in cases where severe pain is not present. Sulfonal is regarded as preferable to bromides, chloral and other combinations as a hypnotic after laparotomies. It may also be mentioned that in that exceedingly intractable disorder—sea-sickness—this remedy has proved an excellent preventive. Further information from W. H. Schiefelin & Co., 170 William Street, New York City.

An "Antidote" of Dyspepsia,

as a somewhat original physician was wont to say, is a most desirable thing to know. It is also true that many well-known drinks that have been used merely to quench thirst have true tonic as well as antipyretic effects. A strong claim to this effect is made for the well-known and universally popular ACID PHOSPHATE, compounded by the late Professor Horsford, of Harvard College, and sold the world over by the Rumford Chemical Works. Read the announcement elsewhere.



COMMUNICATIONS.

Lectures on Hygiene.¹

BY SENECA EGBERT, A.M., M.D.

LECTURE I.



THAT such a study as this one, which we are now about to begin and which so intimately concerns the health and physical welfare of every one, should form an integral part of the curriculum of any broad course of education will, I trust, be sufficiently evident to all, if we stop but a moment to consider its antiquity, its scope and its far-reaching influence on the life of individuals, communities and nations.

Although it was pursued as an art even before the days of Hippocrates (400 B. C.), his treatise on "Airs, Waters and Places" is the first to define some of the principles of public health and sanitation, while in later works he summed up the knowledge of his day regarding the subject under the headings: Air, Aliment, Exercise and Rest, Sleep and Wakefulness, Repletion and Evacuation, and the Passions and Affections of the Mind, and laid down as an axiom that there must be an exact balance between food and exercise, and that disease would result from excess in either direction. Since then the march has been steadily onward, though at certain periods the progress was practically imperceptible and much was necessarily in doubt until the advent of the present century with its discoveries in the allied

¹ An abstract of the lectures on "Hygiene and Sanitary Science" at the Drexel Institute, Philadelphia.

sciences, such as anatomy, physiology, etc., cleared away many obstacles, and stimulated the spirit of original scientific research and inquiry.

Perhaps the first great impulse among English-speaking peoples, especially in matters pertaining to sanitation or "State medicine," can be traced to the labors of Dr. William Farr and the establishment of the British Registrar-General's Office in 1838. From that time on the work of determining the laws and principles of health has been carried on with unflagging zeal by investigators both in America and abroad; and the knowledge gained, especially that of the last fifteen years or so regarding the bacteria and their relation to the causation and true nature of disease, furnishes us with much whereby we may make the foundations of our science more unchangeable and lasting. And though considerable has been accomplished in the past, much more remains for us to do in the future; for it still remains that the mass of the people shall be educated and instructed with reference to the laws of personal and public health of which they are now in ignorance, as well as that continued and earnest effort should be made to secure all that knowledge and power which will reduce to the minimum the conditions that favor and the consequent prevalence of all the preventable diseases, and all that also which helps to fortify the human system against their inception and ravages.

The scope of our study is well indicated by the following from Parkes: "Taking the word 'hygiene' in its largest sense, it signifies rules for the perfect culture of the mind and body. It is impossible to dissociate the two. The body is affected by every mental or moral action; the mind is profoundly influenced by bodily conditions. For a perfect system of hygiene we must train the body, the intellect and the moral faculties in a perfect and balanced order. Looking only to the part of hygiene which concerns the physician, a perfect system of rules of health would be best arranged in an orderly series of this kind. The rules would commence with the regulation of the mother's health while bearing her child, so that the growth of the new being would be as perfect as possible. Then, after birth, the rules (different for each sex at certain times) would embrace three epochs: of growth (including infancy and youth); of maturity, when for many years the body remains apparently stationary; of decay, when, without actual disease, though doubtless in consequence of some chemical changes, molecular feebleness and death commence in some part

or other, forerunning general decay and death. In these several epochs of his life the human being would have to be considered : (1) In relation to the natural conditions which surround him and which are essential for life, such as the air he breathes, the water he drinks, etc. ; in fact, in relation to nature at large. (2) In his social and corporate relations as a member of a community with certain customs, trades, etc. ; subjected to social and political influences, sexual relations, etc. (3) In his capacity as an independent being, having within himself sources of action in thoughts, feelings, desires, personal habits, all which affect health and require self-regulation and control. Even now, incomplete as hygiene is, such a work would, if followed, almost change the face of the world."

To know how to preserve health and obey its laws one must have some knowledge of the human body and its functions, some acquaintance, at least, with anatomy and physiology; he must understand, also, that disease is an entity, that it has definite causes and courses, and that there is a distinction between those maladies that arise from within the body and those from without. Then, one must learn to use the agents at his disposal, both preventive and curative, including all forces efficacious to the purpose. Nor must he forget that health is perishable as well as attainable, that it is rarely fully appreciated until it is gone, and that too often disease comes on stealthily and insidiously.

That much can be accomplished by observing and acting according to the laws of hygiene and sanitary science will be manifest, I hope, as we proceed with our work. For the moment, the following examples will doubtless suffice: Within two centuries the death-rate in London has fallen from about 80 per 1000 almost to 20 per 1000, this being mainly due to sanitary improvements in the conditions and surroundings of the people and to their gain in knowledge of matters pertaining to hygiene. In Munich the introduction of proper systems of sewerage, and, more recently, of an improved water supply, has reduced a yearly average of 594 hospital admissions and 208 deaths from typhoid fever from 1866 to 1881, to an average of only 104 hospital admissions and 40 deaths from 1881 to 1888, the population in the meanwhile having increased from 152,000 in 1866 to 278,000 in 1888. In England and Wales the passage and enforcement of the Public Health Act in 1875, and of other similar measures, has been of such value that the death-rate from typhoid fever has

fallen from 3.9 per 1000 in 1869 to only 1.69 per 1000 in 1888, and the total death-rate from 22.5 for 1861-70 to 19.5 for 1890, a saving of more than 600,000 lives between 1881-50. It is also interesting to note that there has been no epidemic of cholera in England since 1866, though this has not been for lack of opportunity, individual cases having gained entrance from time to time.

The Air.—The whole globe of the earth being surrounded by the atmosphere to the depth of forty miles or more, and it consequently being the most universal and abundant substance of which we have cognizance, excepting, possibly, the ether of the physicists, it is fitting that we first consider the effect of this air and its contents upon health. We know that a certain amount of air is absolutely essential to animal life, on account of the oxygen which it contains; but we shall see that its condition of purity has much to do with our bodily welfare.

The composition of pure air is remarkably uniform throughout the world, considering the fact that it is a mechanical mixture, and not a chemical one. The average proportion of its constituents is: Oxygen, 20.96 per cent.; nitrogen, 79 per cent.; carbon dioxide (CO_2), .03-.05 per cent. In addition to the above there are practically always present traces of ozone, ammonia, sodium salts, and more or less aqueous vapor. Other substances found in it at any time are to be looked upon as impurities. So far as our knowledge now goes, the nitrogen serves no other purpose than to dilute the oxygen. The oxygen is necessary for the countless combustions (oxidations) continually occurring throughout the globe, and for the necessary oxygenation of the blood of animals; the supply is constantly maintained by the higher plant life, which gives off oxygen to the air. The carbon dioxide, within the limits given above, cannot be considered an impurity, for it is ever present, and is as necessary to plant life as oxygen is to animals; it is derived from the combustion of organic matter, from the exhalations and excretions of animals and, in a large measure, from the action of saprophytic bacteria in organic matter in the processes of putrefaction and decomposition. Any excess, however, over the above percentage is to be regarded not so much as an impurity, but as an indication that certain processes are at work which, by their products, may make the air impure.

The impurities to be found in air vary much with the locality, but in any locality whatever may be found there upon the earth's

surface, is likely to be also found as an impurity of the atmosphere. These impurities may be readily classified under the headings: solid or suspended impurities; gaseous impurities, and impurities due to combustion, respiration, etc. In the first class will be found dust from the soil, soot, pollen of plants, bacteria and micro organisms of all kind, particles of food, clothing, furniture, animal matter; in fact, everything capable of being minutely subdivided and taken up into the air by the force of the wind. In the second class will be such gases and vapors as arise from certain factories, laboratories or industries, from the imperfect combustion of fuel, from decomposing masses of organic matter, exhalations from the surface of the earth, etc. In the third will be those practically always co-existent, and especially to be found in the air of inhabited rooms, such as are thrown off from the body as waste during respiration, etc.

Were these foreign substances to accumulate in the atmosphere it would soon result that the latter would be totally unable to sustain life of any kind, and the world would become a dreary waste. There are, however, a number of forces constantly acting in nature, whose function is to remove, dilute or destroy these matters, and so exactly are they related to their work that never, for any great length of time, does the air vary much in composition from the normal. These purifying forces are: Diffusion, oxidation, dilution by winds and the fall of rain. Solid matters fall of their own weight, are washed down by rain or are oxidized and broken up into simpler compounds. Gases diffuse, are diluted by winds, absorbed by the rain, or are decomposed by the action of oxygen and sunlight.

The harm and danger to health from these impurities depends largely upon their nature and physical character. Unless they are the germs of special diseases or certain poisonous gases, they are most likely to affect the respiratory passages and organs, as it is with these that they first and principally come in contact. Solid rounded particles may produce only symptoms of obstruction or irritation, as is seen in the case of coal miners who are especially subject to bronchitis, asthma, etc. If the particles are sharp, however, the lung tissues are readily lacerated, inflammatory processes are set up, and the opportunity for the reception of tubercle bacilli and other disease germs is very great. The mortality from phthisis among metal miners, needle makers, steel grinders, cotton spinners, etc., is remarkable, and they are also

especially subject to emphysema and asthma. The dust of poisonous metals, etc., in the air, such as arsenic or lead, may give rise to characteristic symptoms. The pollen of certain plants is believed to cause diseases like hay or rose fever, and disease germs floating in the air may give rise to their specific maladies; in fact, there is no doubt that the malarial organism may be carried long distances, and that diseases like influenza and some skin troubles spread through the medium of the air. Gaseous matters may cause headache, giddiness, anæmia, loss of appetite, acute or chronic poisoning, according to their character; and that combination of gases called "sewer gas" may have much to do with a low state of health, and an especial proneness to disease and the reception of contagion. Gases from imperfect combustion may cause asphyxia, feebleness of circulation, loss of consciousness, etc. Air vitiated by respiration may, if very foul, cause extremely acute symptoms (increased temperature, loss of appetite, thirst, quickened pulse), and even death; while if less impure, it still does much to weaken the whole system and to cause pallor, loss of appetite, strength, and to increase the liability to contagious and infectious maladies, phthisis and those of a tubercular character.

Milk: Its Adulteration and Relation to Infectious Diseases, with Remarks on Food Adulteration in General.¹

BY WINSLOW ANDERSON, A.M., M.D., M.R.C.P., LOND., ETC.,
Member of the California State Board of Health, California Sanitary Society, State Medical Society, etc.; Editor of the *Pacific Medical Journal*.

Mr. President and Members of the Sanitary Convention:



THE remarkable progress in science that has marked this century, now rapidly drawing to its close, has been freely participated in by all branches of the healing art, and especially so by hygiene and demography. The substantial unanimity with which prophylaxis has maintained its supremacy as the main agency for diminishing the ravages of disease was never in a more satisfactory condition.

¹ An address delivered before the Sanitary Convention of the State of California, in San Francisco, April 17, 1893.

The microscope and chemical laboratory have made it possible for us to pry into Nature's secrets and to wrest from her a knowledge of the origin as well as the means of successfully combating many of the contagious and infectious diseases. We now know that cholera is contracted through our food and our drink, and that the disease is a preventable one.

Last year I spent many weeks in India with cholera raging all around us. The only precautions we took were about eating and drinking. Specific inoculation methods of preventing disease also promise well, even for cholera and tuberculosis. By its means smallpox mortality has been reduced from 50 in 100 to 5 in 100. Hydrophobia in about the same proportion. Typhoid fever need never spread if the dejecta are thoroughly disinfected. So with all the contagious and infectious diseases use strict quarantine, isolation and disinfection. Sub-soil drainage will eradicate the miasmata, and I thoroughly believe that a perfect system of sewerage in San Francisco, and a careful inspection of our food, water and milk supply will reduce our present rate of mortality one-half—that is, instead 19 or 20 deaths in 1000, it will be 8 or 9 in 1000. That cholera, typhoid fever, diphtheria, scarlet fever, etc., are contracted and disseminated by contaminated milk and water, none will, I think, deny. Therefore, I believe that they should be under scientific sanitary surveillance. In this connection I desire to call your attention to these "so-called" *filters*. Here the organic impurities that are not soluble—for no amount of filtering will remove nitrites, nitrates and albuminates or disease germs, these must be removed by distillation or chemical precipitation, but the insoluble substances decompose in the pores of the filters and become really dangerous to health. These filters, if used at all, should be cleaned *daily* instead of monthly.

The Bohemian Club, in this city, had an experience of this kind, and I had a whole family poisoned in this manner. Although we have made immense strides in preventive medicine during the last fifty years, and the duration of life has been prolonged, yet statistics show fully one-quarter of all deaths could be prevented. In California, with its 16,000 annual deaths, 4000 lives could be saved if our wise law-makers, if the *people themselves*, would appreciate what the medical profession can do in the matter of hygiene and sanitation, if they would give us the means to carry out our knowledge for the public welfare.

Before entering upon the consideration of the question announced as the subject of my address, I will invite your attention for a few brief minutes to a brief allusion to what seems to me to be a matter of considerable importance to the welfare of our commonwealth. I refer to the adulteration of our food supply. Since working in this field of experimental inquiry I have become convinced that we do not pay enough attention to what we eat and what we drink. On looking into the subject carefully one is astounded at the enormity of the fraud perpetrated on our unsuspecting citizens. Our United States experts in the government report assure us that one-seventh of all our food supply is adulterated. This fraud is estimated to amount to \$700,000,000 annually!¹ But these figures, enormous as they are, and defrauding as they do 64,000,000 people, sink into invisible insignificance when I tell you that one patent medicine alone is estimated by the New York authorities to have caused the death of 17,000 children in New York City in one year. Is it not high time we urge the adoption of such laws as shall inform the public of the poisonous and adulterated articles of food and patent medicines and prevent their sale?

As time will not permit my entering into detail relative to adulterated articles of daily consumption, I will briefly mention a very few. Take, for example the "staff of life"—*flour* and *bread*. California flour is among the best in this or any other country; but flour has been known to contain potato-meal, rice flour, bean-meal, pea flour and even *plaster-of-Paris*, and bread has been found to contain alum, ammonia, borax, sulphate of copper, sulphate of zinc, chalk, carbonate of magnesia, plaster-of-Paris, bone-dust, bone-ash and white clay.

Yeast powder should receive universal scrutiny. Many brands that I have analyzed contained alum, ammonia, chalk, plaster-of-Paris, white clay, cream of tartar (which is itself adulterated with alum, chalk and terra alba).

Coffee is universally adulterated. One of the most adulterated mixtures is that made of black walnut saw dust, caramel and roasted *horse liver*. This mixture is actually in extensive use. The common adulterants are: roasted and ground peas, beans, potatoes, carrots, corn, rye, oak bark and the *sine qua non*, chicory. This chicory is again made up of roasted rye, wheat, beans, acorns, carrots, parsnips, beet root, *baked livers*,

¹ National Medical Review for 1892, p. 135.

colored earths, oak bark and saw dust. Large hotels have been known to sell their coffee grounds to unscrupulous persons, who have mixed them up with adulterants and resold them as pure coffee. Many of you will say that you use green coffee or roasted coffee in the bean, and it must be pure. Not always. Green coffee and berries of inferior quality are polished with lead and sold for the expensive brand. Worse than this, roasted and ground *acorns*, burnt sugar and chicory are mixed and compressed by special machinery into tablets of the exact size, shape and color of any brand you want, and it is very difficult to distinguish this unwholesome mixture from true coffee.

Tea is another dreadfully adulterated article. Many chests of tea are largely composed of the leaves of the sycamore, the horse chestnut, the plum, the beech, the palm, the elm, the poplar, the willow and the oak, instead of leaves of the tea plant. These foreign leaves are "faced" with plumbago, carbonate and chromate of lead, carbonate of copper, sulphate and carbonate of iron, etc. On close inquiry you will find that quite a lucrative tea trade is going on at the back door of hotels. Tea leaves once used are dried and remixed and sold again, and no one questions the process.

Cheese is one of the most adulterated articles in general use, says the Government report. So I could detail scores of articles in daily use.

Beer that costs one-tenth of a cent per glass and sells for ten cents, making 10,000 per cent. of profit, is now made so cheaply that about 1,000,000 per cent. is made by the industrious. This beverage has been known to contain *coccus indicus*, *capsicum*, ginger, quassia, wormwood, copperas, sulphuric acid, cream of tartar, alum, *nux vomica*, *picrotoxin* and *strychnine*.

Confectionery is one of the articles that should be frequently inspected, for the delicious rainbow-colored sugar plums often contain potter's clay, pipe clay, chalk, plaster-of-Paris, *sand* and many poisonous chemicals, such as sulphide of arsenic, chromate of lead, arseniate of copper, cobalt, zinc, ferruginous earths and the many-colored dyes.

Those who are addicted to the *weed* may find comfort in knowing what they are eating, snuffing and smoking. Thus we find in tobacco corn-husks, cabbage leaves, potato and rhubarb leaves, hay, apple parings, seaweed, sawdust, chicory, copperas, alum, sand and coal dust. All these various "improvements"

are soaked in saline and saccharine solutions and tobacco juice, etc. But the worst is the cigarette, steeped as it frequently is in opium infusions.

Everything that permits of it is sophisticated. The scientific knowledge displayed in adulterating our food supply is worthy of a better cause, and we as sanitarians and members of the various boards of health cannot, it seems to me, serve the State better than to make public all these vile, poisonous and criminal frauds, and ask the public to aid us in their suppression.

Milk.—I will crave your indulgence a few minutes longer while I give you the results of my laboratory investigation on milk. Let me quote, in passing, the able report of Prof. A. L. Metz, chemist to the Board of Health of the city of New Orleans, who proved from his investigations that New Orleans had been paying about \$300,000 annually¹ for the water served in the milk, and that by the present system of milk inspection the city would save from 500 to 1000 children yearly! New York during 1883 under milk inspection reduced the infant mortality 3673 over 1882, when there was no milk inspection. In Philadelphia during 1891, 5488 children died under one year of age from cholera infantum, marasmus and convulsions. Most of these children were hand-fed on cow's milk. Dr. Arnstein found the disease due to fermentation and decomposition of milk, and Dr. Booker found bacillus *ærogenes coli* and bacillus *lactis commune* in the stools.

Scarlet fever epidemics in Glasgow, and diphtheria epidemics in Eton College, England, have been traced to contaminated milk. Typhoid fever has been found to be disseminated in a similar manner. Therefore, the value of scientific milk inspection cannot be overestimated.

Pure cow's milk should have a specific gravity of 1030. It should not become viscid on the addition of ammonium hydrate. Milk should yield from 10 to 14 volumes per cent. of cream, and never less than 3 per cent. by weight, according to modern methods of analysis. On microscopic examination pure milk should contain myriads of beautifully-formed globules of fat, entirely soluble in potassium hydrate. The normal amount of water should be about 87 per cent. The total solids will vary from 12 to 15 per cent., according to the age of the cow, its food, etc., etc. Cows' milk contains about 4 per cent. of casein, including $\frac{1}{2}$ to

¹ New Orleans Medical and Surgical Journal for 1892, p. 287.

1 per cent. of *serum albumin*, and about 4 per cent. of sugar of milk, with a little over $\frac{1}{2}$ per cent. of the salts of sodium, potassium and calcium chlorides and phosphates. The practical points to be observed from our chemical analyses of milk in relation to infant feeding are these: Cows' milk contains less water, less sugar, and less lime salts than human milk, and more casein, *serum albumin*, and fat. Hence cows' milk requires water, lime salts, and lactose. It requires more than this: All cows' milk should be *boiled* as soon as it enters the house. Scalding will not answer. Prof. Bang, of Copenhagen, found that the bacillus of tuberculosis, often present in milk, butter and cream, was not destroyed at the "scalding point," nor even at 150° to 176° F. Sternberg is of the same opinion. Therefore, I advise boiling for several minutes as the only absolute surety of killing the germs of disease in milk. Boiling does more than this: It coagulates all the *serum albumin*, which forms a hard, firm "skin" on the surface of boiled milk. This is the most indigestible part of the milk, and should *always* be removed. This *serum albumin* is the great *unrecognized* cause of the indigestibility of boiled milk, and its removal is of *paramount importance* in infant feeding. By adding about 25 per cent. of boiled water, and 10 per cent. of lime water, with thirty grains of lactose to the ounce, you will reduce the relative amount of casein, and increase the amount of lime, salt and water, besides rendering the milk alkaline, and of about the same sweetness as human milk. In fact, you have the nearest approach to human milk you can obtain.

To recapitulate :

- (1) Boil your milk.
- (2) Skim off the top film of indigestible *serum albumin*.
- (3) Always keep milk in glass or earthenware vessels.
- (4) For infant feeding: Add 10 per cent. of lime water and 25 per cent. of boiled water, more or less, according to the age of the child, and thirty grains of lactose to each ounce.

By these means you have *sterilized* milk. Even the ever-present bacterium *lactis* cannot turn the milk sour by converting the lactose into lactic acid. You have removed the great indigestible *serum albumin*, increased the lime salts, sugar, and water to the human milk standard; in fact, you have made a wholesome, sterilized, alkaline food that resembles human milk in every particular, and one that will agree perfectly with infants.

Recent bacteriological investigations by the New York Board

of Health have demonstrated that tuberculous cows may spread the disease through the medium of milk. A "gilt-edge" milkman had twelve of his suspected cows killed, and everyone was found to be tuberculous. The milk developed tuberculosis in guinea-pigs when injected intra peritoneally, from which the animals died. It is estimated that 3 to 5 per cent. of all cows are tuberculous, and when we reflect that tuberculous patients are flocking to California's balmy shores yearly, and that our cows' milk—some of which *I know* to be tuberculous—is fed to our infants *unboiled*, it should give us great concern for the future of our Golden West, relative to the dread disease—consumption.

M. Miquel gives a very interesting *resumé* of his observations on the number of microbes in milk. He found that one cubic centimetre of milk (about sixteen drops) two hours after leaving the cow, contained 9000 bacteria. In an hour more the number had increased to 31,700, and in twenty-five hours 5,000,000! had developed.¹

Aside from the grave diseases which result from the direct transmissibility of disease germs from the cow, milk is deplorably adulterated. I shall not give you figures for San Francisco, as my researches are not yet completed, but I will ask you to remember those of New Orleans, and draw your own conclusions. Water, of course, is the most constant adulterant, and as this is seldom of the purest sort in cowyards and dairies, it becomes a great danger in times of epidemics. The bluish color water imparts to milk is overcome by the addition of starch, gum tragacanth, turmeric, chalk, decoctions of white carrot juice and annetto. This sophisticated milk is sweetened by glycerine and sugar, and preserved by carbonate of soda, boric acid and salicylic acid.

We do not wonder that our friends from the country remark upon our San Francisco cream. Its condition is due to the hygroscopic state of the atmosphere or to some other occult cause, for there is no denying the fact it is thin. Cream has also been known to absorb arrowroot and magnesia to stiffen it up a bit.

The diseases from which cows suffer that are communicable to man, are: Tuberculosis, splenic fever, anthrax, scarlet fever, foot and mouth disease (eczema epizootica), the "trembles" and cows fed upon poison oak, poisonous berries, weeds and leaves.

Cows should be inspected by a veterinary surgeon frequently;

¹ Journal of the Royal Microscopical Society for 1892.

their milk and their hygienic surroundings should be inspected by milk inspectors, and diseased cows should be instantly killed.

Milk is so universal and so important an article of food that no means should be spared to insure and maintain its purity. Who can estimate the thousands upon thousands of lives that have been sacrificed on account of the impurity and contamination of our milk—for I look upon the cow as the direct means of increasing epidemics and of spreading tuberculosis.

In conclusion, I cannot urge the profession too strongly to advise our municipalities to have milk inspectors and city chemists to guard the public health. Nor can I urge the people of California too strongly to insist upon having pure food and pure milk. The State has a competent State chemist to analyze our food supply, but our ever-wise legislators would rather give \$400,000 to kill coyotes at \$5 per head than they would give one hundredth part of that amount to protect us against poisonous adulterations in our daily food. Look at the millions of dollars that are spent annually for adulterated food, and the hundreds of thousands we pay for the water in our milk, besides the thousands of lives that are sacrificed yearly on account of our poisonous and contaminated milk. Is it not high time this infamous traffic was stopped? I appeal to this convention to support me in my laboratory investigations, and to assist me in devising measures for the prevention and suppression of milk and food adulteration.

Emergency Hospitals.¹

BY GEORGE G. GROFF, M.D.,
Member of the State Board of Health of Pennsylvania.



EVERY community is liable to emergencies which may demand temporary hospital accommodations. In Pennsylvania such need has in recent years followed floods and the ravages of contagious diseases, and may, at any time, result from fires, cyclones, earthquakes, riots, etc. The State Board of Health, believing that a knowledge of the essentials of a temporary hospital would be of value to the people of the State, has ordered this circular prepared for distribution.

¹ Issued by the State Board of Health of Pennsylvania.

Location of the Hospital.—The healthiest possible location should be chosen. It should be on elevated, porous, dry ground. It should be in the open fields; not in a crowded portion of the town. It should be freely open to the air, but protected from severe chilling winds. If the need for the hospital occurs in the summer time, no place is more suitable than an old orchard with a fine sod and grateful shade. A deep valley should not be chosen for the site, nor the neighborhood of a swamp or open sewer. If

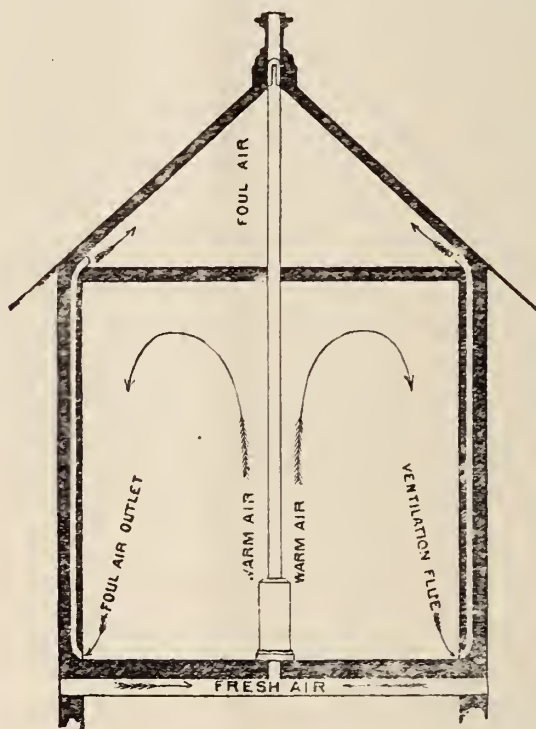


FIG. I.—Showing provision for "ridge" ventilation. (Hutchison).

good scenery is available, it should be secured, as cheerful surroundings conduce to rapid convalescence.

A sufficient supply of pure water is, of course, a prime necessity. The neighborhood of any offensive industry, such as a slaughter-house, bone boiling establishment or glue factory should be scrupulously avoided.

The Materials of Construction.—Any suitable vacant building might in an emergency be turned into a hospital, but generally it

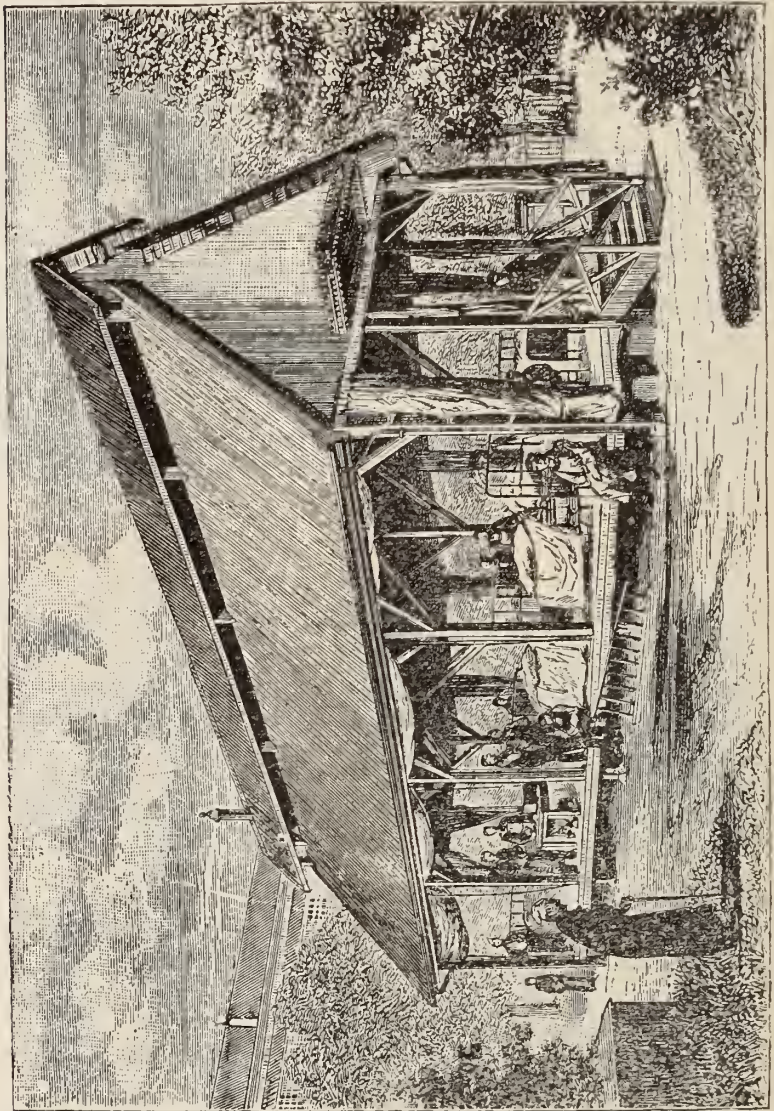


FIG. 2.—Portable hospital pavilion—exterior.



FIG. 3.—Portable hospital pavilion—interior.

will be necessary to construct one. This may be either of frame or canvas. Frame structures are more permanent and substantial, and may be used either summer or winter. They are also warmer



than tents for cold climates. An objection is that they cannot be so quickly constructed.

Portable frame houses are now to be obtained of a size appro-

pritate to a small number of patients, and with special arrangements for ventilation, constituting admirable pavilion hospitals. They can be put up at very short notice, and if they become seriously infected are not so expensive as to lead to much hesitation about their destruction by fire. Cuts of such are introduced. It might be well for every town not having a permanent hospital to provide itself with one or more such buildings, which could be stored in small compass until needed.

In favor of tents it may be urged that by means of them we may have a hospital almost instantly. The patient being more nearly in the open air, proceeds to recovery more quickly than when in ordinary enclosed hospitals. They cost very little. Cowles, in his "Treatment of the Sick in Tents," remarks :

"It must readily be seen how simple and easy a thing it is to provide good hospital accommodations in any emergency—no matter how sudden and unexpected—that the prevalence of epidemics and infectious diseases may occasion." Dr. F. H. Brown, speaking of tent hospitals, says: "The more nearly patients are brought to the condition of being treated in the open air, the more quickly and surely will they recover. The wooden barrack and the hut are good, but in many cases the tent is better."

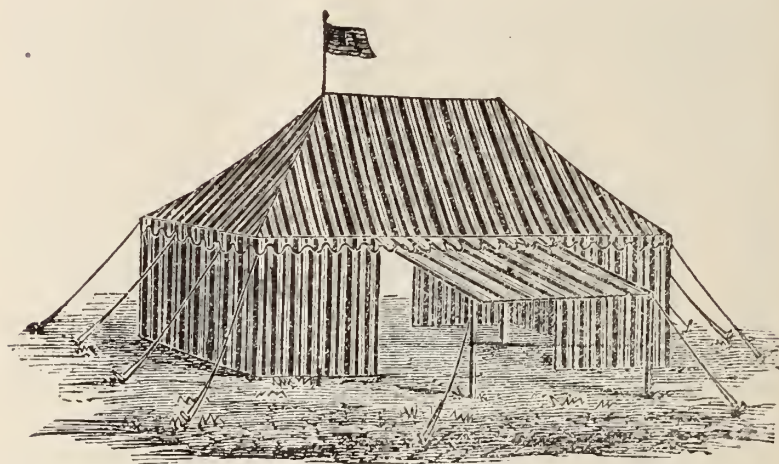
Dr. J. H. Kellogg, of Battle Creek, Mich., writes in *Hand-book of Hygiene and Medicine*: "During the late war a large hospital had in the winter season 320 cases of measles. Just at this time it took fire and burned to the ground. The patients were placed in tents, and all but one or two recovered. If the patients had remained in the hospital there is no doubt but thirty to forty, at least, would have died. At one time 100 men, but slightly ill, were sent to the general hospital at Nashville, and seventy-five of them died."

Such hospital tents have been in use in Berlin, Vienna, Leipzig, Dresden and Frankfort for years with great success.

The frame "Pavilion" hospital here shown is from a cut in *La Nature*. The hospital is in use in Geneva, Switzerland. It is intended to make the canvas walls double in the winter time. The movable walls are just the thing to give ideal ventilation, in a word to place the patient in the open air on pleasant days, and to protect him at night and during inclement weather. The cut also shows an excellent opportunity for ridge ventilation.

The Hospital "Hut."—In cases of contagious diseases which it may not be advisable to admit to the general hospital, where

such exists, authorities recommend what is called the "hut." In that this is a permanent structure only it may be considered superior to the tent. The accompanying plan is from



Tent No. 1

Wylie's excellent work on the "Construction and Organization of Hospitals."

Each of these huts is planned to have two fresh air ducts from the roof passing down to within seven feet of the floor, and there



FIG. 5.—Ground plan of Tent No. 1, 14 x 21½ compartment tent.

provided with scatterboards. Whether pavilions, huts, or tents are used, they should be thoroughly trenched around to prevent dampness.

The Furniture.—Such articles of furniture only as will not

absorb and retain disease germs should be in hospital wards. Small rugs, which can be destroyed when necessary, should take the place of carpets. No upholstered furniture should be used. The bedsteads should be of iron, nickel-plated. The mattresses of wire, rather than of hair. The beds should be of the two-thirds size rather than smaller or larger.

Administration.—At once, in any emergency, when it has been decided to open a hospital, one trained nurse of experience and as many other nurses as may be deemed necessary should be secured. In case of catastrophies, such as that of Johnstown for example, each physician in the community who may have patients in the hospital should have full and absolute care of his own patients. There should, however, be a physician-in-charge, who should carry out the treatment of the local physician when the patient is under the care of any such. But in the case of infectious diseases, such as smallpox, diphtheria, scarlet fever, and typhus fever there should, if possible, be a resident physician, who should not mingle unnecessarily with the community, and no others should be admitted save in grave emergencies, and then only with the observance of strict precautions.

THE PHYSICIAN IN CHARGE.¹

The physician in charge, if not residing in the hospital, should visit the hospital daily, or oftener, if the circumstances of the patients shall require it.

He should have entire direction of the medical treatment of the patients, and the general direction and management of the hospital, subject to such rules and regulations as the sanitary committee may from time to time impose.

He should have the control of the nurses, and should promptly report to the sanitary committee any irregularity committed by them, and should suspend them, if necessary, and report the facts to the sanitary committee for action thereon.

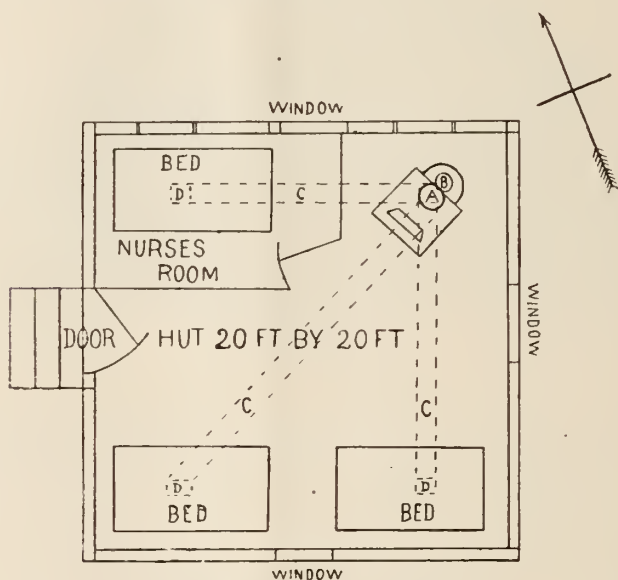
He should record the name of every patient with the date of admission, age, sex, color, nativity, occupation, disease, and the date of discharge or death, as the case may be, and such other matters as he or the sanitary committee may consider important or necessary.

He should make a daily report to the sanitary committee or

¹ The health officer of any city or borough, if a physician, should be eligible to the position of physician in charge

Board of Health, stating the number of patients admitted since the last report, with the disease, recoveries, deaths, and such other information as he or the sanitary committee may think requisite.

He should, also, make a weekly report to the sanitary committee or the Board of Health, which should contain a summary of the daily reports, and such other matter as he or the sanitary committee may consider requisite.



Isolating Wooden Hut (Wylie).

A—Stove. B—Smoke flue. C—Air conductors under floor from under each bed to stove. D—Openings into air ducts.

THE STEWARD.

Should there be so large a number of patients that the physician in charge cannot attend to the administration of the hospital, it will be necessary to appoint a steward.

The buildings, tents, grounds and property of the hospital should be under the general charge of the steward, subject to such general rules and regulations as the sanitary committee may impose.

He should require that the hospital be kept scrupulously clean; that all garbage and excreta be destroyed by fire or

buried at a distance of not less than 100 yards from any stream or well, and that all cast-off clothing, rags, and bandages be destroyed by fire; that the clothing and bedding of patients be frequently changed, and that thorough ventilation be maintained.

He should take charge of and inventory the effects of all patients that may be admitted into the hospital and return them, after having been disinfected, to the owner when discharged; or in the event of the decease of the patient, a report of such effects should be made to the sanitary committee.

He should superintend the work of disinfecting clothing, beds, bedding, etc., and see that it is efficiently done, and must enforce the rule that every patient, immediately before leaving the hospital, must take a bath and be supplied with non-infected clothing.

He should see that all fires and lights are extinguished in every part of the premises under his control before ten o'clock at night, excepting such as may be absolutely necessary, and these he should leave under proper care.

He should make out and transmit to the sanitary committee, at the close of each week, the pay-roll of all nurses and attendants employed at the hospital.

THE MATRON.

It may also be expedient to appoint a matron. The matron should take care that each patient has the diet which the physician has prescribed, superintend its preparation, and have it served at regular stated hours.

She should have charge of the bedding, bed clothing, and such wearing apparel as may be provided for the patients; should have general supervision of the laundry, and should see that cleanliness is maintained throughout the hospital.

She should have charge of the table for the officers and employees of the hospital, and in conjunction with the steward should have control of the servants and nurses.

Such hospitals should be under the immediate supervision of

THE SANITARY COMMITTEE.

In all incorporated cities this should be a committee of the city Board of Health. In boroughs, until such time as the legis-

lature shall authorize them to establish Boards of Health, the borough council should appoint such committee from its own members. In villages having no municipal authorities the county commissioners and poor directors should jointly appoint the committee. In the case of contagious diseases the Board of Health, or if there be no Board of Health, the Sanitary Committee, should transmit a weekly report to the State Board of Health. The expenses of the hospital in such cases should be borne by the county.

Health Resorts.

BY T. A. STODDARD, M.D.,
Of Pueblo, Colorado,
Member American Health Resorts Association.



ATELY the tendency is rapidly toward the treatment of pulmonary consumption and various other diseases by climatic influences. This method of dealing with a certain class of diseases is not positively new, but science has made such advances in late years that we know why *this* climate has an influence for good on *this* disease, and why *that* climate has influence for good on *that* disease, and, therefore, we are prepared to advise our patients, as to locality, intelligently.

We must consider altitude, temperature, sunshine, humidity, prevailing winds, etc.; but there is something more than climate that must and will be taken into consideration by the intelligent physician, who is aiming to place his patients where they will have a good chance of being benefited, and whose aim is not to get his patient "off his hands" before death claims the privilege.

Now, according to a writer in the February number of THE ANNALS of HYGIENE, a "health resort," to meet the proper requirements, must have no sounds therein which jar or grate harshly on the over-sensitive ear, such as the ringing of bells, blowing of whistles, crying of hawk-sellers, etc., in fact, nothing "*preventable* that offends the senses" must exist.

I am at a loss to know where such an Eldorado can be found.

In fact, such a condition of things cannot obtain in or at any place worthy the name of a health resort, at least in this country, for various reasons:

(1) Very many persons who need climatic treatment are women who must have some of the comforts of civilization; and where will we go and obtain comforts, and not have some or all of our senses shocked at times, to say nothing of ringing of bells and blowing of whistles.

(2) A health resort does not choose its clientele, and there must be met all classes of men and women, and at sight and sound of some of these will not the senses of others be offended?

(3) A place to be a health resort, in the best sense of the word, must certainly provide for the amusement of the health seekers; and how shall these amusements be had in a wilderness?

(4) Many who must, in order to live, go to a health resort, must even there gain a livelihood by the "sweat of their brow," and how can this be accomplished if the resort to which the invalid has gone is beyond the reach of the sound or sight of civilization?

(5) If the invalid does go into the wilderness, on what does he live? Pure, dry air, and soil and pure water? I apprehend not. But suppose he does so exist, are there no sounds which grate harshly upon his over-sensitive ears? And if there are no sounds, what more offends the sense of hearing than interminable, unbroken silence.

I admit, "Ay more," I would insist that a health resort should be a place which is fully up to the standard of modern sanitation; but in order to this, I would hardly dare say that there should be no one permitted to dwell there because of the likelihood of the air and earth being polluted by the effects of living. Nor would I say that Mr. G should not live there because Mr. F's senses were very much offended when he happened to hear or see Mr. G.; but I would say, provide proper drainage, a wholesome water supply sufficient to flush drains, small ash pits for every house which must be emptied as soon as full.

Water-closets provided with efficient traps and ventilation, enforcement of sanitary laws and with the advantages of proper altitude, a large amount of sunshine, the largest possible number of days when patients could be out of doors, small relative humidity, warm prevailing winds, air filled with electricity and ozone, good boarding and hotel accommodations, plenty and

variety of amusements, possibilities for obtaining remunerative employment—at least for men—out of doors, good educational advantages, the possibilities of attending the churches of our particular faith even at the risk of occasionally hearing a bell, the facilities of reaching the place in one of George Pullman's sleepers at the risk of hearing a steam whistle and the opportunity of having our laundry attended to even though it were in a place where steam was utilized, then we have a health resort worthy the name and where people may safely come and bring their families and live as they were designed to live; not in solitude, but surrounded by comforts which are enhanced by the proximity of their fellows. I did not, when I started to write this, intend to speak of any particular place where the conditions are most favorable for the consumptive or asthmatic, but upon reflection I feel it my duty as a physician, and one who has been greatly benefited, to place before the readers of this journal the name of the city in which I have regained my health.

I came to Pueblo a little more than a year ago weighing 104 pounds, coughing almost incessantly, and having hæmorrhage (pulmonary) frequently. I have had but one hæmorrhage since coming, my cough is gone, and I now weigh 130 pounds. The latitude here is 4480 feet above sea level. The prevailing winds are west and northwest. The air is extremely dry, the relative humidity being below 45. The number of fine days for the year ending February 28, 1893, were 315. We have a good and abundant water supply. The drainage is good, and the mortality for last year was only 8.6 per 1000. This includes all who died of consumption and who came here in the last stages of the disease only to die, all cases of accidents on railroads, in steel works and smelters, those dying in the hospitals, many of whom are brought here from mining camps in different parts of the State for hospital advantages, and those dying in the State Insane Asylum, which is near the city. Deaths from contagious diseases as follows: Typhoid fever, 21; scarlet fever, 2; diphtheria, 7; measles, 1; whooping-cough, 2; mumps, 1. Consumptives and asthmatics coming here at once experience a remarkable relief and exhilaration, which is doubtless due to the amount of electricity and ozone in the air. I could name dozens of men and women who are living here in the enjoyment of perfect health, who came here but a few years ago complete physical wrecks, and of whom it was prophesied that they would not reach Pueblo alive. But consumption and asthma are not the only diseases on

which our climate has a curative effect. All forms of malarial poisoning and rheumatism are speedily cured, or greatly relieved. So also those in that condition of neurasthenia which is brought on by mental or physical overwork are here restored to their normal condition, and are enabled to look at life through other than a dark colored glass.

We have here an abundant supply of mineral waters. There are at least five artesian wells which give a large supply of mineralized magnetic water which has been found of benefit in rheumatic affections. One artesian well has a supply of natural salt water drawn from a depth of 250 feet, in which the sick and healthy can freely bathe with benefit and pleasure.

There are other natural sources of mineral waters, as the Carlyle Springs, which produce the most delightful, sparkling soda and iron water I have ever tasted, the analysis of which is as follows: Carbonate of soda, carbonate of lime, carbonate of magnesia, carbonate of iron, sulphate of potassa, sulphate of soda, sulphate of lime, chloride of sodium, carbonic acid. This spring is splendidly situated, and is deserving of the attention of capitalists.

The Parnassus Springs, among the foot-hills of the Rockies, about twenty miles from Pueblo, furnish every variety of mineral water. These springs are surrounded by magnificent pine groves, and here those who so desire can spend the summer in tents and bathe as often as they wish in either the warm or cold springs.

The cost of living at these springs is small, as all the necessities of life can be had from a ranch about one mile and a half distant.

The facilities for reaching Pueblo are excellent. There are five trunk lines of railroad, the Rock Island and Santa Fe bringing passengers from Chicago without change of cars. The Missouri Pacific, Union Pacific and Burlington with one change.

The population of Pueblo is about 35,000, and there are many sources of enjoyment. The people are courteous to strangers, and do all they can to make the stay of the invalid pleasant as well as profitable.

I had not said so much, but in the interests of humanity we should all do what we can to place before poor, suffering mortals, so far as possible, if not the means, the knowledge, which if acted upon will restore to health and save from speedy death many lives valuable to our common country, to science and to the world at large.

Little Pale Faces—What Shall We Do for Them?

BY M. D. STERLING, M.D.,

Philadelphia.



AMONG the children of our large cities a physical condition known as anæmia is only too common. It is the result of want of fresh air, an improper diet, overstrained nerves and undeveloped muscles. Stand at the door of any of our school houses, built, too, with all "the latest improvements" at an immense expense to the public, and look at the hundreds of pupils issuing therefrom at the hour of dismissal. How many children can you count of a truly healthful appearance? Pale or sallow complexions where the pink and white skins ought to be; thin, pinched faces where one would naturally look for plump cheeks and dimples; eyeglasses prematurely worn, a nervous excitability, or else an unchildlike languor, where unimpaired vision and the normal buoyancy of youth should prevail; bony arms, narrow cheeks, "spindling shanks" where hardened muscles and well-expanded lungs should make limbs and thorax alike shapely. These you will behold again and again. Ah! this army of pale faces flocking to and from our schools! Does not every mother's heart ache at the sad procession? Does not every conscientious teacher regret her share in a pernicious system of education that develops the minds at the expense of the bodies of the pupils?

Curled beside the register, stooping over text-book or slate, the fear of "losing marks" ever present to its mind, here we have a promising subject for the dread anæmia. This is the child that hurries to school every morning leaving breakfast quite untasted, for a stomach weakened by sympathy with an overtaxed brain turns from food with nausea. This is the child who has no relish for bread or milk, broiled mutton chop, oatmeal porridge, rice pudding, or like wholesome fare, but whose capricious appetite must be tempted with dainties which, though agreeable to the taste, are ruinous to the digestive powers. Who does not recognize a picture of perverted childhood seen in many homes?

Much of the talk about physical training in our schools is pure cant. That our "pale faces" need such training nobody

denies, and provision for it is duly made in the daily exercises. But what are ten minutes of light gymnastics worth as a counter-balance to half as many hours spent in mental labor? Never will such a dreary substitute for exercise send the warm, red blood flowing through the vessels, waking every organ to natural activity, thrilling with new vigor the whole physique. Rather let a playground be provided next every school building (even if it has to be done by buying and tearing down adjoining property; the money would be well invested). There let both teachers and scholars join in the good old-fashioned sports that have descended through the generations and are worth for health-giving exercise a dozen gymnastic "systems" rolled into one. We all know how much more interesting is a walk which has "an object," be that object no more than the purchasing of a pair of shoestrings, than is an aimless "constitutional." So the exercise we take by means of some pleasant outdoor game, in which *to be on the winning side in our game*, is our object, with never a thought of the benefit to nerves and muscles, is more inviting and, therefore, more beneficial than moving our limbs to the rhythmic "one-and-two and three-and-four" of the gymnasium. The latter becomes monotonous, except when kept for rainy day indoors improvement only; the former is ever new.

Yes, our city children are pining for play—not play with "a lesson" hidden somewhere about it, but a play "just for fun," in which teachers and scholars can join with real zest, going back to their work with re-created vigor. That teachers should join in the playground sports proposed is self-evident: First, on their own account, to prevent or cure the "nervous prostration," of which we hear so much in their trying profession; and second, because if children are left to their own devices the naturally strong will engage in sports too rough for the weak or the timid, not to speak of the opportunity to annoy its mates that is given to the viciously-inclined child by the absence of authority.

The absurd custom of holding examinations in the heated days of June, when little people as well as big folks need relaxation instead of increased tension, is one against which every mother in our land should protest. To sacrifice a single child's health for the sake of gratifying a teacher's ambition to attain "good results" (save the mark!) is too dear a price for any parent to pay. Yet not one child, but hundreds and thousands of children, undergo the tortures of reviews and examinations year after year, and are

triumphantly "promoted" with *high marks*, which the school thermometer successfully emulates, for it, too, is climbing up to "ninety," and "one hundred," along with our little pale faces. Why, in the name of common sense, not to mention so unimportant a subject (?) as hygiene, should not examinations, if they must be held at all, come at the end of the year—just before the Christmas, instead of the midsummer, vacation?

Fresh air, enjoyable exercise, and freedom from mental overstrain being secured, if we neglect the children's diet we are still much to blame if anæmic conditions appear, for nutritious food to a growing child is only a degree less important than the air it breathes. In some schools there are lunch counters well provided with doughnuts, pretzels, pickles, molasses candy, and skim milk; here, at recess hour, the janitor drives a brisk trade exchanging his dyspeptic dainties for the scholars' pennies. In less pretentious establishments "the apple woman" at the school gate dispenses lunch from her basket; her fare differs from the janitor's but slightly, and is like it precisely so far as real nourishment is concerned.

Now, if the plan of having playgrounds is not feasible, if hot weather and examinations are never to be divorced until millenium's dawn, surely to provide their scholars with wholesome luncheons *is* within the teachers' province. In a certain Friends' school, noted for the generally healthful appearance of its pupils, cakes, pies, and candies are banished from the recess bill of fare; hot chocolate or cocoa, good, rich milk, a wholesome hot broth, tongue (not ham) sandwiches are furnished at actual cost to the little customers. Thus, for one cent a small glass of milk is provided, for two cents a large glass; a small bowl of broth for three cents—a larger one for five; sandwiches five cents each; chocolate or cocoa two, three, and five cents per cup; bread and butter one cent per generous slice. The principal of this school insists that the food provided shall be of the very best quality. In his wise judgment "the lunch" is as important as any part of the school course, for it either helps to upbuild or assists in undermining the physical constitutions of the little ones entrusted to his care. He defines education as a leading out of *all* the powers, bodily as well as mental, in harmony with each other. That good old saying, "a sound mind in a sound body" is his motto. Would that it were the motto practiced by every parent and instructor in our land! Childish "pale faces" would then be the exception, not the rule.

The Morbid Proclivities and Retrogressive Tendencies in the Offspring of Mulattoes.¹

BY W. A. DIXON, M.D.,
Of Ripley, O.



BSERVATIONS extending over a period of more than thirty years have thoroughly impressed the conviction upon my mind that the offspring of mulattoes are the subjects of constitutional diseases to a greater degree than those of unmixed blood, and that when confined strictly to their own class, they scarcely reach the fourth generation in descent, by reason of disease and sterility.

I have often wondered if others have had occasion to notice this feature in mulatto life, or whether the conclusions at which I have arrived are false and unwarranted from being based upon observations confined to a local district, yet rich in examples that go far to establish the view propounded. I believe that there is not much to be found in current medical writings upon the subject. Our locality is on the border between the free and slave States of fifty years ago and more. It was then, and long before had been, the custom of many wealthy planters, as they advanced to old age, to set free that portion of their estates which bore to them a filial relationship, and establish them in homes in a section of country where they would receive fair treatment, consideration and respect, as citizens and members of the community in which they should reside.

Such an opportunity was offered to them in our locality largely populated by abolitionists and sympathizers with the slave.

Thus, a community, as it were, of mulattoes, whose parents, on the father's side, were white men, mostly of great wealth and position, socially and politically, and principally of New England stock, existed near us.

The most of these people were complete types of physical perfection, tall, muscular and perfectly developed.

Many of them lived to old age, quite to 100 years. Their wives were mulattoes. They were proud of their parentage and light color of skin. They made good citizens, and often were prosperous as farmers. Their prosperity and pride almost separated them from their less fortunate brethren of darker color, and

¹ From The Journal of the American Medical Association.

their children intermarried, that their color and race might continue.

I can trace some of these families through three or four generations. Those of the first cross were robust ; those of the second were paler, more ashlike in complexion, of slender form, plainly bearing many of the characteristics of predisposition or inevitable tendencies to special diseases, of the strumous type. The third union resulted in less fertility and greater predisposition to disease. Now, the children present the scrofulous physiognomy. The fourth union, still less fertile than the others, brings forth a progeny largely suffering from cutaneous affections, ophthalmia, rickets, dropsy of the head, white swelling of the knee joints, morbus coxarius, diseased glands, suppurating sores, until the whole generation is quite extinct. I can scarcely find any of the fourth generation in good health.

These people have had all the advantages that their neighbors enjoyed. They had the best of schools, excellent religious privileges, were moral, upright and highly respected.

They were able to maintain an academy of learning, from which their sons and daughters could go forth amply equipped to struggle in the unequal contest of life. All of these institutions succumbed to the waning constitutional vigor of their offspring. The academy is no more. The schools and churches, so ably maintained by their forefathers, are extinct.

The old family name is scarcely heard, and inquiry reveals the fact that their offspring were tuberculous, and either died in youth, or, if living, were so sterile that no descendants, scarcely, of the old families can be found.

This is true, not only of one, but of many groups of families. The contrast between the histories of the mulatto and the white and the negro families residing side by side, as to health, as to power to resist disease, and as to longevity, is too great to escape notice, or to be regarded as merely incidental. It is now observable by the colored people themselves that if a mulatto marries back to the parent stock, the children escape to a greater degree scrofulous affections.

I have spoken to a number of physicians in this locality upon this subject, and they all agree that tuberculosis exists to an excessive degree among the mulattoes ; that they are inferior in vitality, intelligence, and consequently morality ; that they exhibit a mortality more considerable than that of the surrounding whites

and negroes, and without reunion with the parent stock the mulattoes would soon become extinct. In the first generation they are quite prolific among themselves and arrive at maturity rather promisingly, but when these children intermarry they and their offspring are not prolific, a large portion being sterile at even the second and third generations. It is noticeable that the mulatto girls develop in advance of both white and negro girls, but fade away, as women, much sooner. It is noticeable also that in the second and third generations of pure mulatto intermixture, that quite all the children born are girls, who are noticeably sterile. This fact I have observed so much that I believe it to be a physiological truth. I would be pleased to learn if the observations of others who have given any notice to this subject confirm my own.

If this is true in one locality and in the mingling of the white and black races there, why not look for the same result in the cross of races elsewhere, and thus the introduction of the virus of constitutional diseases, which is transmitted through the succeeding generations?

I believe that ethnologists mainly agree that human hybridity cannot be maintained without reversion, or fresh supply from parent blood. Dr. Robert Knox, in his work on "The Races of Men," says: "I do not believe that any mulatto race can be maintained beyond the third or fourth generation by mulattoes merely; they must intermarry with the pure races or perish." M. Georges Pouchet says "that such a race, such a type, can only have an ephemeral existence." Dr. Paul Topinard refers to a record on this subject in North Carolina: "There the caste of free men was constituted entirely of mulattoes freed by their white fathers. The State, dismayed at the important position which they assumed, put a stop to this liberation. Left to themselves, their number diminished at the rate of 29 per cent. decennially."

Ethnologists "have sought in vain among the nations of the earth for a race manifestly hybrid, with well-defined characters, intermediate between two known races, perpetuating itself without the concurrence of the parent races."

Dr. Prichard, in his natural history of man, in his efforts to find such, subsisting by themselves, could only point to three instances—the Grikwas, the Cafusos and Papuans. Broca and others object to the truthfulness of the examples, and assert "that by no means do they prove that a mixed race can perpetuate itself separately."

If Dr. Prichard, in his vast researches, finds it difficult to discover three examples only of hybrid races subsisting by themselves, and they so liable to objection that the other ethnologists deny the proof to be conclusive, then may we not inquire into a cause for the introduction and propagation of diseases, physical weakness, sterility and conditions unfavorable either for moral or physical development, beyond the microbe or bacillus?

The same causes which degenerated and brought to an ignoble end some of the royal lines and the most ancient blood of Europe are at work still, and in our midst also. Look, and wherever you see the greatest intermingling of races there you see raging tuberculosis, carcinoma and struma in all their terrorizing forms; there you see an excessive mortality among the children, a disparity between the number of men and women, the women being in the majority; there you see the scientist with his microscope hunting for the enemy of life and health in the spirta, the excreta and the cell elements, when in fact the modification of the racial type, by the influence of some media not apparent in the cell elements themselves, altered in some way by the process of miscegenation, generates this virus—these microbes, these bacilli, which claim for their victims more than 25 per cent. of the dying.

Are there any races comparatively free from tuberculosis and all strumous affections? Wherever you see the purity of race maintained, in civilized or barbarous countries, there you see little or no tuberculosis and scrofula. Do these affections prevail among the Jews and other unmixed races to anything like the extent that we see in countries overrun by immigrants of every race, producing crossed races without limit or regard to race affinities?

Broca mentions the assertion of several ethnological writers, "that the United States, where the Anglo-Saxon race is still predominant, but which is overrun by immigrants of various other races is, by that very circumstance, threatened with decay, inasmuch as this continuous immigration may have the effect of producing a hybrid race containing the germs of disease, decay and sterility." There are serious men who have predicted, from ethnologic causes, the overthrow of the United States, just as Ezeiel predicted the ruin of Alexandria.

The difficulty in finding instances in the past of nations surviving such influences may excite faith in the prediction, in spite of our unexampled growth, that the fundamental facts as to the perpetuation of crossed races will ultimately prevail even in our own country.

In conclusion, I am fully conscious of the fragmentary nature and narrow scope of this paper. I have made no attempt to go into the literature upon this subject, with which, indeed, I am too imperfectly acquainted. I have simply endeavored to briefly set forth these crude ideas, which have been the outgrowth of my own observation. If they stimulate the profession to a livelier sense of the importance of looking back beyond the bacillus, and of teaching purity of race in order to secure greater freedom from tuberculosis, less imbecility and insanity, and greater longevity than are found among any race of hybrids, it will fulfil the object for which it was written.

The Restriction of Scarlet Fever.

BY C. A. LINDSLEY, M.D.,
Secretary of the State Board of Health of Connecticut.



THE prevalence of scarlet fever throughout the State has been particularly noticeable for more than a year. It has occurred in more than 100 towns in the State. In some towns its presence has been persistent every month, as may be seen by reference to the *Bulletins*.

In other towns the report of single cases have been made, or of an outbreak in a single family, and the prompt and intelligent supervision of the patients by the local health officers has entirely prevented its spread to others. This result is in striking contrast with the practice in a majority of the towns. The following interview lately with the health officer of one of the larger towns in the State illustrates the usual method of dealing officially with contagious diseases, by too many local health officers :

Secretary of S. B. H. Dr. ———, if in obedience to the sanitary laws which are in force in your town, you received a notification to-day of a case of scarlet fever in a family in the town, what would you, as the health officer of the town, think it your duty to do ?

Dr. ———. If the case was a member of an intelligent American family with ample means to provide what they needed, and if a doctor was in attendance, I should expect the doctor and the family to take the necessary precautions, without any personal attention on my part. If the case was a member of a poor

family I would provide them with disinfectants and tell them how to use them. And I would tell them they must not permit the neighbors to come into their homes while the sickness lasted. If a doctor was in attendance I would expect him to see that the disinfectants were used. That is all I think my duty requires me to do.

Scarlet fever broke out in that town about four months ago. It is needless to say that at this writing, under such sanitary administration, the disease is still prevalent, with cases scattered all over the town, and at every point of the compass from the post office. There are many health officers in Connecticut with no better conception of their duties than the one just quoted.

All scientists now agree that every new case of scarlet fever or diphtheria results from the contagion of a previous case. That being true, it follows that these diseases cannot extend to fresh subjects unless the said subjects are personally exposed to the sick persons, or to some article containing the infection derived from the sick ones. The law of public safety is expressed in two words: Isolation—Disinfection. If a second case occurs it is proof that these have been neglected. Partial isolation and disinfection are of little or no value. To be at all trustworthy they must be complete. Then and then only are these means infallible.

They are not easy to secure. The residence of the patient should be put under hospital regulation, with the health officer as director. All unnecessary intercourse absolutely forbidden. A placard on the door should declare the disease.

No one now can object to this, since the President of the United States has permitted it at the White House during the recent illness of his grandchild.

The inmates of the house of the sick person should not be allowed to ride in a public conveyance.

Disinfection is not less difficult. Telling the family how to disinfect is wasted time. There are very few families who can put verbal instructions into practice, without omitting something essential to success. And that omission defeats the attempt. All disinfection of infected houses or apartments should be done under skilled supervision. This cannot be too earnestly insisted upon.

The duties of the health officer are continuous from the notification of the disease until the recovery or death of the patient, and the disinfection of house and everything with which the patient has been in contact.

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All subscriptions to "THE ANNALS OF HYGIENE" are taken "until ordered discontinued," and no agent has authority to make any other arrangement. At end of time to which subscription has been paid or promised, a bill for a year in advance, with return envelope is sent, and if journal is no longer wanted, the subscriber should mark "Discontinue" on the bill and return to us. A failure to so return bill is considered an order to continue.

A System of Immigrant Inspection Service.

LAST month the following communication was formally presented to the Honorable the Assistant Secretary of the Treasury, Mr. Spaulding, in the absence of the Secretary, by Dr. John H. Rauch, former secretary of the State Board of Health of Illinois, chairman of the committee; Dr. Pinckney Thompson, president of the State Board of Health of Kentucky, and Dr. Benjamin Lee, secretary of the State Board of Health of Pennsylvania; the other members of the committee who were prevented from attending all authorized the appending of their signatures to the memorial. They were Dr. C. N. Metcalf, secretary of the State Board of Health of Indiana; L. F. Salomon, secretary of the State Board of Health of Louisiana; J. T. Reeve, secretary of the State Board of Health of Wisconsin; C. O. Probst, secretary of the State Board of Health of Ohio; F. W. Reilly, secretary of the State Board of Health of Illinois, and Wirt Johnston, secretary of the State Board of Health of Mississippi. Supervising Surgeon General Wyman, of the Marine Hospital Service, introduced the committee to Secretary Spaulding, who received them courteously, and listened with close attention and evident interest to the arguments advanced in support of the measure, promising to bring it to the early attention of the chief of the department.

CHICAGO, APRIL 19TH, 1893.

The Honorable The Secretary of the Treasury, Washington, D. C.

SIR:—The undersigned, a committee of the "Sanitary Council of the Mississippi Valley," were appointed to formulate the request embodied in the

following resolution, adopted by the council at its recent meeting, April 7, in New York City:

"Resolved, That the Secretary of the Treasury be formally requested by the Sanitary Council of the Mississippi Valley to authorize the United States Hospital Service to establish a system of immigrant inspection service with especial reference to Asiatic cholera, and substantially on the lines of the service maintained with such beneficial results in 1882."

The immigrant inspection service of 1882, to which reference is above made, grew out of the demonstrated inability of State and municipal health boards and officials, acting independently, to suppress the epidemic of smallpox which began in 1880, through infected immigrants, and which continued until mid-summer, 1882, through successive arrivals of these infected immigrants, who, by reason of failure of the maritime quarantine, found their way into the interior despite the enforcement of such precautions as were possible by individual health authorities in their respective territories.

In June, 1882, a continuous sanitary surveillance of immigrant travel, from the port of arrival to the point of ultimate destination, was begun by the National Government through the agency of the National Board of Health. Such surveillance consisted of successive inspections at points of distribution between the seaboard and points of ultimate destination; of vaccination of all unprotected; of systematic observation of suspicious sickness; prompt removal and isolation of discovered smallpox or other contagious diseases; of disinfection of garbage, clothing, cars, etc.

This service was continued until December, 1882, and while, during the five months preceding the inauguration of the service, there had been twelve serious outbreaks of smallpox in Illinois alone, caused by infected immigrants, during the seven months of the service, June to December, 1882, there was not a single outbreak in that State due to immigrants, and only two cases developed among the immigrants themselves after coming within the purview of the service; this, too, in face of the heaviest autumn immigration, with one exception, ever known. During these seven months a total of 115,057 immigrants were inspected in the Western inspection district alone, and the epidemic in Illinois was practically suppressed after a duration of two and a half years, and after having cost the people of the State over four million dollars. Similar results obtained throughout the seaboard to the States beyond the Mississippi.

The system was demonstrated to be in the interest of our own people, who were secured by it from imported contagion, and to whom confidence was therefore restored; of the immigrant, who was protected through it from the effects of his own neglect of sanitary precautions, and to whom it brought better care and increased comfort in transit across the country; and of the common carriers of these immigrants, who were relieved from the vexatious and costly interruption of travel and traffic caused by the enforcement of local and State quarantines.

The Sanitary Council of the Mississippi now urges that the immigrant inspection service be re-established with especial reference to the control of Asiatic cholera, should it reach our own country; and, incidentally, although, perhaps, but little less importantly, of typhus fever and small-

pox. In making this request, it is fully appreciated that the regulations of the Secretary of the Treasury, governing inspections at foreign ports and maritime quarantine generally, promise a greater degree of protection from abroad and on the seaboard than ever heretofore attained. The result of many years practical experience must not, however, be forgotten. This experience has demonstrated that the sense of responsibility and consequent thoroughness of work on the part of quarantine officers and inspectors bear a direct relation to the distance between the station of the inspector or quarantine officer and the point of ultimate destination of the immigrant. Inspectors on duty at foreign ports, surgeons on board vessels from these ports, and quarantine officials at our own ports, lack the stimulus that an inspector in Ohio or Indiana or Illinois derives from the knowledge that if Asiatic cholera or smallpox or typhus fever should break out among the immigrants that have passed through his hands—his failure to interrupt the disease could readily be traced home to him—not alone from the towns and prairies of his own State, but from the lumber camps and villages of Wisconsin, and the wheat fields of Iowa and Minnesota, or the still more remote regions beyond the Mississippi and Missouri. Such a stimulus secures both vigilance in inspection and thoroughness in enforcing necessary measures of prevention.

The preventive work abroad and on our frontiers will, undoubtedly, exclude a large majority of the infected persons and things—immigrants and their effects—which might otherwise be admitted. But in the present contingency this is not sufficient. The whole should be excluded, but if any part be admitted, it must be detected and isolated so promptly as to prevent not only the spread of disease, but the panic and injury to business that invariably follow the announcement of the presence of cholera. A very few cases of this dreaded disease upon any of the great lines of travel during the next six months would, if not quickly suppressed, tend to cause financial disaster. It is respectfully urged that those to whom have been confided the authority and the means for protecting the public health, should be satisfied with nothing less than the fullest obtainable protection. Without in the slightest degree reflecting on the energy and efficiency of the several State Boards of Health, the fact must be recognized that, for the performance of this work of trans-continental inspection, they are seriously hampered by divided responsibility and locally limited authority. The most effective measure by which the accomplishment of this result can be assured, is to establish behind the lines of seaport quarantine the inspection service recommended by the Sanitary Council of the Mississippi Valley, which would inspire confidence and secure the co-operation of the State with the national health authorities.

The Committee will promptly act upon any intimation from you that further argument or details are desired.

Meantime, we are, Sir,

Very respectfully, your obedient servants,

JOHN H. RAUCH, *Chairman*.

L. F. SALOMON, Louisiana.

PINCKNEY THOMPSON, Kentucky.

J. T. REEVE, Wisconsin.

BENJAMIN LEE, Pennsylvania.

C. F. PROBST, Ohio.

C. N. METCALF, Indiana.

WIRT JOHNSTON, Mississippi.

F. W. REILLY, Illinois, *Secretary*.

The importance of this measure cannot be over-estimated. If we want to avoid disease, and it is fair to assume that every right-thinking person does, we must resort to those measures that experience and common sense have demonstrated to be effective, and among these none is more important or more operative than an intelligent and active inspection and supervision of our immigrants.

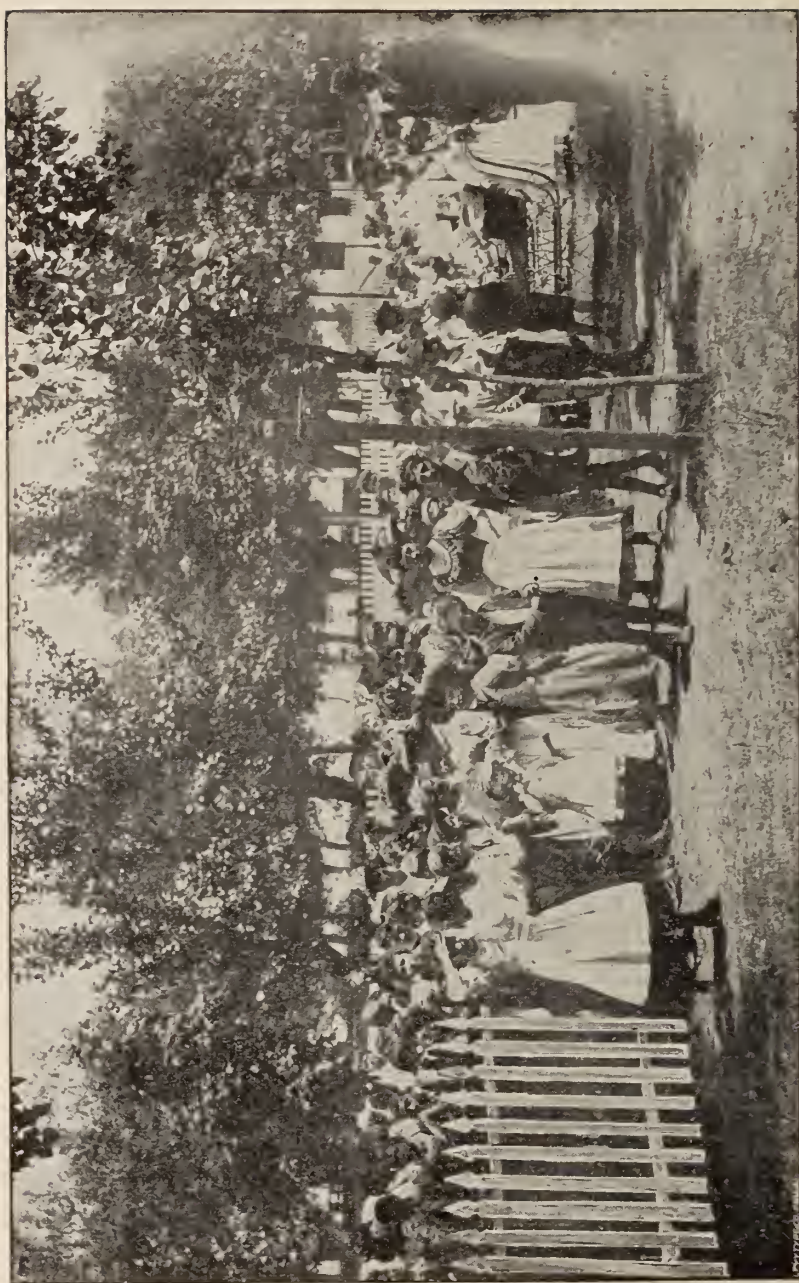
Little Pale-Faces.

IN contrast to the pen-picture which is elsewhere, in this issue, presented of our little ones, we would ask our readers to allow their minds to run along the grooves that these illustrations will chisel out for them. These three pictures represent scenes characteristic of one of the worthiest charities that can claim the aid of man. The Sanitarium Association of Philadelphia is doing for the poor children of Philadelphia that which many parents, well able to do it, neglect to do for their own children. "Fresh air; oh, give me fresh air!" this is the cry that is ever issuing from the blanched and shriveled, prematurely aged, never fully developed little bodies of the children, rich and poor alike, who are condemned by the dictates of a miscalled civilization to see the light of day and pass their whole existence in the foul atmosphere of a large city.

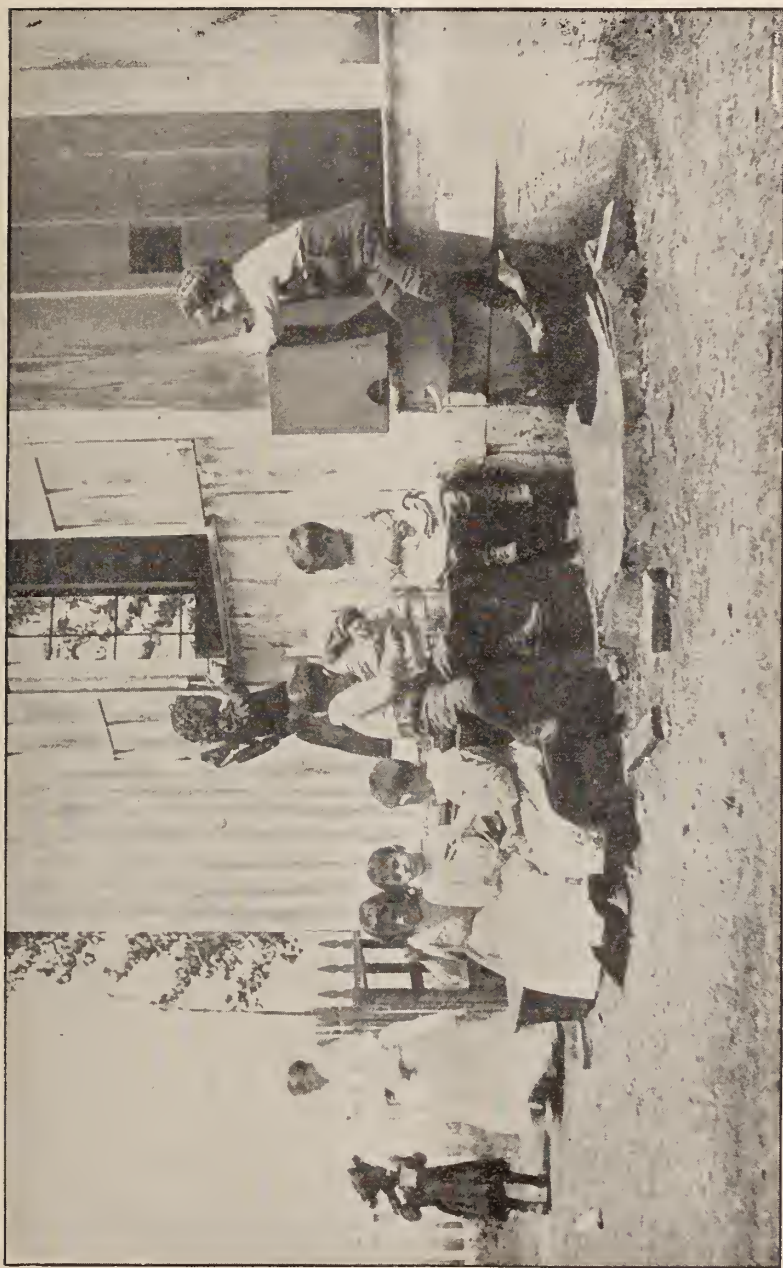
Sneer as the cynic may, call us cranks and all the names you can think of, you cannot make more than four out of two twos; and no more can you make a typically healthy man or woman out of a city-born, city-reared boy or girl. There is no theory about this; it is fact—solid, undeniable, indisputable fact; and there is no getting away from it. The urban puppet may be æsthetically pleasing to the eye, but it is the suburban man or woman who makes the world move, and who makes history. This is a fact capable of proof; and the lesson is that we should, at least for a portion of the year, allow our children to enjoy the pure air with which God has limitlessly endowed the country. Now-a days, there is but little excuse for any one to live in a city, and no excuse whatever for the denial to our children of that which they have a right to have, at least a portion of the year, the warm months of summer, to romp and play in the pure air of the country.



A PART OF OUR HAPPY FAMILY.



COLLECTING NEAR THE LANDING.



LUNCHING BEHIND THE SOUP-HOUSE.

Household Water Filtration.

IN view of the threatened and very likely invasion of cholera this summer, we would take occasion to urge upon our readers the importance of filtering the water that they use for drinking and cooking purposes. It is a precautionary measure that is always in order, but particularly is it to be commended when we are confronted with a disease, the chief avenue of transmission of which is the water that we drink. A good filter ought to be as much a part of the furnishing of every well-ordered household as a chair or a dining table, and much more so than the draperies and hangings that all must have and no one ought to have.

But be sure that you have a good filter; a poor one, by giving a false sense of security, will do more harm than good. We do not write this editorial to advertise any particular filter, hence refrain from giving any names, but to any one making inquiry we will name what we consider the best.

Cleanliness.

SO eminently true are the following words, which we find in the *Chicago Herald*, that we cannot resist the temptation to reproduce them in full:

"There is no immediate danger of my filling a millionaire's grave, and yet stranger things have happened. Either you or I may fall heir to a colossal fortune. I don't lose sleep over the prospect myself, nor need you, my dear, but in this world of ups and downs who can tell what a day may bring forth?

"Shall I tell you a few of the things I propose to do with my possible millions? In the first place, I shall build bath-houses and stock them with soap, perfumes and towels for humanity at large. Next to saving the soul comes the care of the body, and most people are fully as heedless of the one as the other. Indeed, to my manner of thinking a sanctified soul in an unwholesome body would be hardly worth the keeping.

"I declare unto you, and if I do not speak the truth come forth and dispute me, ye who can, that the masses of mankind know less about cleanliness than animals do. Watch the old cat sitting in the sun or by the corner of the kitchen fire washing her face and cleaning her paws. She enters into the thing with a complete understanding that cleanliness makes her a more

welcome fireside companion, as well as a healthier cat and a more self respecting member of society. A bird delights in its morning bath more ostentatiously than in its breakfast. I have seen horses at the seashore who reveled in a "dip" far more than any human ever did. A dog will not enter your presence if there is any soil upon his person which his own limited ingenuity can remove, and the most beatific experience of a pampered poodle is its perfumed bath and careful shampoo.

"Now, take the case of humans. There is not a day of my life that business dealings do not force me into companionship with people who are both unwholesome and repulsive by reason of lack of personal cleanliness. I ride with them, I walk by their side, I sit next them. They dress well, their clothes are of expensive material and carefully made, but they bear about with them an aroma of stale cuticle and closed pores. From week's end to week's end these men and women do no more than dip their hands in a little water and rub off their faces with inadequate wash cloths. If the natural smoke of Chicago settles upon such portions of their anatomy as are exposed, they dab it off with hard water and cheap soap, or they counteract it with filthy powder rags. They go for weeks at a time without a change of underwear to save laundry bills, and they sleep in the same flannels that they wear by day.

"A good, thorough bath is as unknown to them as God's grace to a lost soul, and for my part I would rather encounter a thug with a club. You can dodge a club, but you can't escape an odor. Ride for an hour in one of our cars, either cable, horse or steam; could anything be worse, without it was a stock transit? And yet all these unwashed and unwholesome people pride themselves, and often most justly, on being good citizens, well educated and circumspect. They would resent the idea of being classed outside the circle of 'gentlemen and ladies.' They never sneeze in your presence without begging pardon, nor commit any breach of the proprieties without the keenest anguish of remorse for the misdeed. Their crime against society, then, is not an active one. It is merely the result of a neglected education. Their parents believed in making them obedient, no doubt, and polite and well behaved. They had them taught to dance and play the piano and speak French, but they forgot to teach them cleanliness.

"The poor and uncared-for we expect to take as we find them, and by means of prayer, faith and good works raise them to

higher levels. But what shall be done for the folks who ought to know enough of the laws of hygiene and beauty to keep clean, but who in fact know as little as the totally ignorant and the very poor? When I get my millions, then I shall erect 1000 bath-houses right here in Chicago, and I shall legislate laws that shall make cleanliness compulsory. Women shall find it more profitable to go to the bathhouse than to the club, and men shall find more attraction in the physical laundry than in the saloon. There shall be no possible entree for the careless keeper of the beautiful body into either saloon, street car or public assemblage of any sort. He shall be shunned like a leper, and when his case is pronounced hopeless there shall be a modern Molokai fitted up for his habitation, that he may trouble the olfactories of the sons and daughters of earth no more forever."

Look Out for Bilge-water.

AS a non nautical sanitarian, we have not been wont to accord that place to bilge-water as a carrier and disseminator of disease to which it seems justly entitled, and fearing lest some of the authorities having in charge the disinfection of vessels may not have had their attention called specifically thereto, we feel that a few words on the subject will not be out of place.

In the first place, that we may have a clear understanding of the subject, we understand "bilge-water" to be that collection of liquid refuse that finds its way, by leakage from above, into the holds of ships, and that lies there undisturbed, but gradually increasing for years. That such refuse must be foul beyond the power of words to describe there can be no doubt.

Our attention was called to this subject by a gentleman who had passed through a yellow fever epidemic. He told us of a yellow fever ship that came into the port of Norfolk; she was thoroughly fumigated with sulphur over and over again before she was taken to the wharf; everything was disinfected; but as soon as the crew commenced to pump out the bilge-water they dropped like poisoned rats with yellow fever. The lesson is obvious; the bilge-water of an infected ship should be not only pumped out, but its place should be filled, and that repeatedly, with pumpings of a disinfectant solution, and this should be followed by a thorough saturation of the hold with steam. This may be the rule at some quarantine stations, but it should be at all.

Pulpit Hygiene.

THREE cheers for the clergymen of Philadelphia and for all who will follow their glorious example! And why this outburst of hygienic enthusiasm? Because the clergymen of Philadelphia, without respect to creed, have awakened to the practical truth that a clean soul and a clean body and a clean city are very likely to be found the one closely allied to the other. There was recently held in this city a very largely attended meeting of ministers of all religions, at which it was very truly stated that in matters of hygiene there are no Republicans or Democrats, Populists or Prohibitionists, Roman Catholics or Protestants, Unitarians or Trinitarians, *but all are Christians*. There is no such thing as a Republican sanitarian or a Democratic, a homœopathic, an old school, an eclectic or a Thompsonian sanitarian; there is no such thing as a vegetarian or a "hot water cure," or an "herb" sanitarian. The platform of the sanitarian is unchangeable, irrefutable, impregnable, divinely beneficent, and it rests upon the unerring and indestructible supports of the laws of nature. Sanitation is a common ground upon which all religions, all shades of political faith, all the various degrees of "crankism" can meet in accord, and now that the ministers of religion are coming to our assistance we may expect great progress in our warfare with disease.

Great big, healthy, vigorous, six foot six Rev. Dr. McVickar deserves everlasting credit for his suggestion that clergymen should present the question of municipal cleanliness to their congregations, for in it we recognize the germ of the gospel of cleanliness, which ere long we hope to hear preached from every pulpit in the land.

Though the soul may be divorced from the body after death, it is during life most intimately associated therewith, and there is infinite wisdom in the assertion of General Booth, of the Salvation Army: "That *scrubology* and *soapology*, as well as theology, are most potent christianizing agencies."

Let us then give all honor to these clergymen who seem fully to realize that the body is worth consideration as a means to the betterment of the soul, and let us earnestly hope that this movement will not be an ephemeral one, but will roll irresistibly onward, gaining strength as it rolls, until every clergyman in the land will become an earnest, ardent exponent of the glorious doctrines of the gospel of health.

The Pan-American Medical Congress.

THE Section in Marine Hygiene and Quarantine has been organized as follows: Honorary presidents: Dr. Lino Alarco, Lima, Peru; Dr. Henry B. Baker, Lansing, Mich.; Dr. Cardenas, Managua, Nicaragua; Dr. J. J. Cornilliac, St. Pierre, Martinique, F. W. I.; Dr. Felix Formento, New Orleans; Dr. H. B. Horlbeck, Charleston; Lieutenant-Colonel Amalio Lorenz, Sub-inspector of second class Spanish Navy, Havana; Dr. F. Montizambert, Quebec, Canada; Dr. Francisco Nuñez, St. Tecla, Salvador; Dr. Juan Ortego, Guatemala, Guatemala; Dr. Joseph Y. Porter, Jacksonville, Fla.; Dr. John Pringle, Kingston, Jamaica; Dr. Juan J. Unoa, San José, Costa Rica; Dr. J. Mills Browne, Surgeon-General, United States Navy. Executive president: Dr. Walter Wyman, Surgeon-General, United States Marine Hospital Service, Washington. Secretaries: Dr. S. T. Armstrong (English-speaking), 166 West Fifty-fourth Street, New York; Dr. G. M. Guitéras (Spanish-speaking), United States Marine Hospital Service, Washington. Advisory Council: Dr. H. M. Biggs, New York City; Dr. John C. Boyd, United States Navy; Dr. H. R. Carter, Norfolk, Va.; Dr. W. M. L. Coplin, Philadelphia; Dr. A. G. Clopton, Galveston, Texas; Dr. C. G. Currier, New York; Dr. S. Durgin, Boston; Dr. Seneca Egbert, Philadelphia; Dr. George Homan, St. Louis; Dr. W. T. Jenkins, New York; Dr. J. F. McShane, Baltimore; Dr. G. H. F. Nuttall, Baltimore; Dr. S. R. Olliphant, New Orleans; Dr. Dabney Scales, Mobile; Dr. R. M. Swearingen, Austin, Texas.

The executive president desires to call the attention of all members of the medical profession that are interested in the topics pertaining to this section to the regulation of the congress, that contributors are required to forward, not later than July 1, to the secretary of the section, abstracts, not to exceed six hundred words each, of the papers they propose to present before the section.

The topics that will be considered by this section are as follows: (1) The hygiene of vessels, commercial or naval, including the questions of ventilation, heating, sanitary arrangements, the disposal of cargo so as to facilitate disinfection, food supply, etc. (2) The medical officers of passenger vessels; methods for their selection, duties, etc. (3) The vital statistics of seamen and firemen. The question of the medical examination of crews preparatory to shipping. (4) The supervision of vessels by

government medical inspectors at ports of arrival and of departure. Code of rules of handling an epidemic disease that breaks out on shipboard. Disinfection of passengers and crew during a voyage. Location and arrangement of ships' hospital. (5) Epidemic and exotic diseases propagated by shipping. What diseases should be quarantined. Responsibility of nations for epidemics; India for cholera, South America for yellow fever. Can a feasible plan be devised to totally exterminate cholera? International intervention to prevent the propagation of cholera or other epidemic disease by pilgrimages or immigration. (6) International uniformity in quarantine regulations. Should quarantine officers be notaries public? (7) Arrangement of detail and equipment of quarantine stations: (*a*) inspection stations; (*b*) local quarantine stations; (*c*) refuge stations. Methods for handling infected or suspected vessels. Interstate and inland quarantine; sanitary cordons; camps of refuge; camps of probation. Recent improvements in hospitals for infectious diseases. Railroad inspection and quarantine. Length of time vessels should be held in quarantine. Conditions that should determine proclamation of quarantine against a country. Under what requirements may passenger traffic be carried on between a port infected with yellow fever and a Southern port of the United States during the summer with the least obstruction to such traffic? What merchandise should be considered as requiring treatment if shipped from a port or place infected with cholera, yellow fever, or smallpox? (8) Methods of disinfection: (*a*) persons; (*b*) baggage; (*c*) cargoes; (*d*) vessels. Recent improvements in quarantine appliances; steam chambers; sulphur furnaces. Liquid sulphur dioxide as a disinfectant. Treatment of ballast: water; solid. What time should an infected vessel be detained in quarantine?: (*a*) for cholera; (*b*) for smallpox; (*c*) for typhus fever; (*d*) for plague; (*e*) for yellow fever. Methods of disposal of the bodies of those that die while in quarantine.

Should Heed.

"City rulers should be aware of the coming criterion by which they will be judged. Mere population will not give a city fame. Healthfulness is the first and indispensable requisite. Not numbers, but a low death rate, which signifies a high health rate."



Remarkable Age.

Mrs. Margarita Rivera, grandmother of Governor Calan, of Coahuila, died at Monterey, Mexico, at the age of 132 years. She was born in Spain, and came to Mexico over a century ago. She recently received from the Archbishop, at Madrid, a copy of the Cathedral record of her birth. Her health for the past several years had been very feeble, and she was confined to her room.

The Cretins of the Pyrenees.

At a recent meeting of the Paris Biological Society, M. Regnault, in the name of M. Lajars, of Avignon, presented a note upon the trophic disorders of the nails and hairs observed among the cretins of the Pyrenees. The children are born without hair, or with short hair; they have no eyebrows. Their nails are thickened and hypertrophied. These peculiarities are met with in fourteen families of Salies de-Béarn, and in one of these dental troubles also occur. These people are found only in Salies and certain surrounding villages, in which there are saline springs. It is said that they are descended from lepers, and they are treated as lepers. It is possible that they may be.

Hotel Sanitation.

The "Travelers' Association" of Vienna lately addressed a memorial to the Home Office, drawing their attention to a grievance seriously affecting that class in the approaching danger. Hotel proprietors, they say, do not recognize the present risk of allowing their water-closets, sheets, towels, etc., to become fouled. Though having all the appearance of being newly done up, the serviettes are merely dampened with a few drops of water, pressed and then returned to the table for use, under the base pretence of being clean, while they contain all the germs of saliva, etc., of a preceding user. The government has issued an order that all articles not properly disinfected, down to the drinking utensils, will subject the proprietor to a severe penalty.—*Medical Press.*

Italian Organ-grinders and Their Children.

It is stated by Italian journals that there exists in Italy the practice of selling children to itinerant organ-grinders for service as performing children in the streets of New York, Paris, Berlin and Vienna. In France, Belgium and England, out of 1,000,000 children, 280,000 die before their tenth year; in Italy the number is 480,000.

Fasters in History.

Le Progrès Médical says: "Succi, the famous faster, has invented nothing new, and has had predecessors in his career. *La Liberté* mentions an instance. During the pontificate of Clement V, in 1306, a Frenchman in the papal service made a pilgrimage to Jerusalem. Upon his return from the Holy Land he ceased to eat, or, at least, he was never seen to take nourishment. He pretended to live without eating for two years, and was looked upon as a saint. Later, a revulsion of opinion occurred; he became suspected of witchcraft and magic, was publicly flogged, and exiled from Rome."

Diet in Diabetes.

The following rigorous diet is recommended by Dujardin-Beaumetz, of Paris: Eggs, fish, meats of all kinds, poultry, game, oysters, fish and cheese.

All green vegetables are permitted except beets, carrots and beans.

Fatty foods are recommended, such as sardines in oil, herring, lard, goose grease, ham fat and caviar.

All soups are permitted when made of meats in combination with cabbage, poached eggs and onions. Put no bread or toast in the soup.

Only dietic breads are to be used, and saccharine in place of sugar.

All starch foods are strictly forbidden, as sweet fruits, pastries and chocolates.

Patients may drink claret wine diluted with Vichy, but no poor wines, liquors or spirits.

Daily exercise, morning and evening, in open air; fencing and gardening, and other light exercise.—*Medical Mirror*.

Doctors of Hygiene at the University of Durham.

The University of Durham, England, has added two more degrees to their list, available for those who undertake the study of medicine. The degrees in question are to be known by the symbols "B. Hy." and "D. Hy.," or Bachelor and Doctor in Hygiene, respectively. The course will not only partially cover the ground comprised in the "D.P.H." and the diploma in Public Health granted by several of the other universities, but it will also include examination in such subjects as bacteriology, vital statistics and sanitary medicine.

The Influence of Forests on Health.

From the many experiments and close observations carried on in Europe, particularly in Denmark and France, there seems to be no doubt but that forests exert a salubrious influence on health. It is claimed that no epidemic ever spread in the vicinity of a forest. We are, of course, speaking of forests, and not of swamps and jungles. Trees absorb large quantities of water. The Australian eucalyptus, transplanted in California, will absorb many times its weight of water in twenty four hours. Trees also absorb carbon and exhale oxygen, thus purifying the atmosphere. It has also been determined that forests exert a pronounced influence on the rainfall in the vicinity; they temper the atmosphere from extreme heat or extreme cold, and we believe more attention should be given to this important subject. Most large health resorts in Europe are located near or in some extensive forest, and we believe this an excellent plan. From our personal observation we have found that patients with tuberculosis, chronic bronchitis, emphysema, and many forms of asthma do well in the neighborhood of the forests. We have also found that these patients do well in conservatories and rooms containing growing plants, always excluding those having disagreeable and obnoxious odors. We also believe it advantageous to have growing plants in sleeping apartments, on account of their absorption of carbon from the CO_2 , and their exhalation of oxygen. A person requires less sleep in the open air, or in an atmosphere rich in oxygen than he does in a closed and ill-ventilated room. The most refreshing sleep we ever enjoyed was in the pine forests of Norway. Six hours sleep there gave us more rest, more oxygen, and a greater sense of satisfaction than nine hours did in London.

—*Pacific Medical Journal.*

The Importance of Antisepsis in Dental Surgery.

This subject, which can hardly be too often brought under notice, is ably discussed by Dr. Miller, of Berlin, in the current number of the *Dental Cosmos*. The hands of the operator, just as with a surgeon, should be thoroughly cleansed, especial attention being paid to the nails. With regard to instruments, particularly forceps and excavators, he maintains that absolute sterilization should be demanded, inasmuch as infectious matter is much more readily communicated by them than by the fingers, and, further, because the sterilization is so easily accomplished that there is no excuse whatever for neglecting it. The method of sterilizing instruments, now most commonly in use, is by means of boiling water containing 1 or 2 per cent. of carbonate of soda to prevent rusting, but, personally, he prefers to add carbolic acid, lysol, or trichlorphenol. To carry this out two sets of instruments are necessarily required. Dr. Miller further mentions mouth mirrors and drinking glasses as being liable to convey infection.

“The Telephone Ear.”

We hardly needed Mr. Rudyard Kipling's vivid sketch of the life passed at the end of a telephone by the American millionaire in summer quarters to bring before us that latest outcome of a too keenly competitive civilization, the “telephone ear.” That particular neurosis, which seems, in the New World at least, to be earning a place in classification with the “lawn tennis leg,” had already been foreseen and described by Prof. Lannois, of the Lyons Medical School. For ears which are not especially sound he considers the telephone to be quite contraindicated, as even in a comparatively robust organ its continuous use is followed by symptoms more or less grave—cephalalgia, vertigo, hyperæsthesia, insomnia and sometimes psychical disturbances of a character which might become chronic. He counsels a sparing use of the instrument in the case of those whose ears are sound, and an absolute abstention from it in those whose organs are already impaired from causes hereditary or induced. His memoir, which was read and discussed in a confirmatory sense at the Congress of Aural Surgeons held in Paris in 1889, will be found in the “Comptes-Rendus et Mémoires,” p. 265, for the same year.—*The Lancet*.

Factory Legislation in France.

The new French law relative to the employment of children and women in factories, etc., which was promulgated on November 2, prohibits the employment of children in workshops, factories, mines, quarries, etc., unless they have received a certificate of physical fitness for the work from a medical man authorized to grant such certificates. The inspectors of labor can always demand to have children in such establishments, under the age of sixteen, medically examined, to determine whether the work they are called on to do is beyond their strength. A bill has also been introduced into the Chamber of Deputies which provides that no woman is to be allowed to work in a factory or workshop, or in the fields as an agricultural laborer, within four weeks of her confinement. In case of need, an allowance of one franc a day will be made during this period. Of this allowance, one-half will be provided by the State, and the other half by the department.

The Remedial Use of Apples.

Chemically the apple is composed of vegetable fibre, albumin, sugar, gum chlorophyl, malic acid, gallic acid, lime and much water. Furthermore, the German analysts say that the apple contains a larger percentage of phosphorus than any other fruit or vegetable. The phosphorus is admirably adapted for renewing the essential nervous matter, lecithin of the brain and spinal cord. It is, perhaps, for the same reason, rudely understood, that old Scandinavian traditions represent the apple as the food of the gods, who, when they felt themselves to be growing feeble and infirm, resorted to this fruit, renewing their powers of mind and body. Also, the acids of the apple are of singular use for men of sedentary habits, whose livers are sluggish in action, those acids serving to eliminate from the body noxious matters, which, if retained, would make the brain heavy and dull, or bring about jaundice or skin eruptions and other allied troubles. Some such experience must have led to our custom of taking apple sauce with roast pork, rich goose and like dishes. The malic acid of ripe apples, either raw or cooked, will neutralize any excess of chalky matter engendered by eating too much meat. It is also the fact that such rich fruits as the apple, the pear and the plum, when taken ripe and without sugar, diminish acidity in the stomach, rather than provoke it. Their vegetable sauces and juices are converted into alkaline carbonates, which tend to counteract acidity.—*North American Practitioner.*

Death Through Laughter.

A curious case of accidental death formed the subject of investigation before a coroner's jury recently, the ostensible cause of the fatality being the act of laughing, in which the deceased, at the London County Lunatic Asylum, was indulging at the moment of death. In company with two other attendants she was engaged in conversation, in course of which an amusing story was narrated, the effect of which was to create irresistible laughter on the part of the deceased nurse, who, in the effort to repress her excessive mirth, bent forward as though to stifle it, and forthwith died. The post-mortem examination subsequently made of the body showed that the cause of death was an accumulation of pericardial fluid, by which the free action of the heart was so much impeded that the extra strain produced by the attempt to stifle laughter resulted in its permanent cessation.

Clothes and Disease.

The State of Massachusetts in 1891 passed an Act to prevent the manufacture and sale of unhealthy clothing, which during the last year has been made more stringent. It begins by defining as a workshop any house, room, or dwelling place which is also used for the purpose of making, altering, repairing, or finishing for sale any wearing apparel of any kind. It requires these places to be licensed, and puts them under the supervision of police inspectors, who are to report to the State Board of Health any evidence of infectious diseases in goods or workshops, and empowers the board to issue such orders as the safety of the public may demand. All articles made in tenements must bear upon them a label with the words "tenement-made," and showing the town where the work was done. The conditions of license are that the apartments and surroundings shall be absolutely clean, and that no work is to be done in a sleeping room. Notice is to be sent to the inspector of the district if a case of infectious disease occurs in the family, or if the family removes, and no person not being a member of the family is to be employed in finishing the articles.

Dr. Piercy, of Antigua, says that negroes suffer from malaria quite as badly as whites.

Food and Hygiene of Old Age.

The food of old age should be simple, nutritious, but not too concentrated, not too largely nitrogenous. It should be taken four times a day, in less quantity as a whole than in middle life, and in a soft and friable condition. Stimulants and narcotics should be avoided, unless required by life-long habit. Tea and coffee may be allowed in moderation. The calls of nature should be promptly attended to. All excesses should be avoided, and regularity, temperance, and moderation observed in all things. Careful protection from cold and atmospheric vicissitudes is required. The mind should be kept active to the last. Avoid worry and fret. Look on the bright side of life. Take plenty of sleep. Have the best of care in health, and of nursing in sickness. Avoid passion, excitement, luxury, over-exertion. Thus will life be lengthened, and old age made enjoyable.—Dr. J. M. French, of Milford, Mass., in *Journal of the American Medical Association*.

House Cleaning in the Tenements of New York.

The Board of Health held a special meeting March 20, to take measures to lessen the death rate among the tenements. The following resolution was passed :

Whereas, It is of great importance to the welfare of this city that the cleanliness necessary to the preservation of the public health should be secured without delay ; therefore,

Resolved, That the sanitary superintendent be and is hereby directed to cause a thorough and systematic inspection to be made of the sanitary condition, first, of yards and cellars ; second, of roofs and roof tanks ; third, of the water-closets, plumbing and drainage ; fourth, of the walls, ceilings and floors of every tenement in this city ; and whenever any want of cleanliness, or any defect in plumbing or drainage, or any other unsanitary condition is found, to order that the said premises be immediately cleaned and repaired.

Dr. Edson has already commenced the work.

Restaurant coffee, according to a Paris journal, is a mixture made of horse liver roasted in the oven, black walnut sawdust and caramel.

Detection of Frozen Meat.

The process adopted by the author for distinguishing between fresh meat and that which has been preserved in the frozen state consists in expressing a little blood or meat juice from the sample, and examining it under the microscope. The whole operation must be performed quickly, in order to prevent any drying up of the liquid under examination. When the juice of fresh flesh is thus examined it is seen to contain numerous red corpuscles, which are normal in color, and float in a clear serum. In the case of blood from frozen flesh the corpuscles have dissolved in the serum under the influence of the low temperature, and not a single normal red corpuscle can be seen. The hæmoglobin escapes into the serum, and appears as irregular, yellow-brown crystals. These may be frequently seen by the naked eye, but in every case can be readily detected under the microscope.—Mal-jean, in *J. Pharm. Chim., Chim. Zeit.*



State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania.

PRESIDENT,

HON. SAMUEL T. DAVIS, M.D., of Lancaster.

SECRETARY,

BENJAMIN LEE, M.D., of Philadelphia.

PEMBERTON DUDLEY, M.D., of Philadelphia.

J. F. EDWARDS, M.D., of Philadelphia.

GEORGE G. GROFF, M.D., of Lewisburg.

J. H. MCCLELLAND, M.D., of Pittsburg.

S. T. DAVIS, M.D., of Lancaster.

HOWARD MURPHY, C.E., of Philadelphia.

BENJAMIN LEE, M.D., of Philadelphia.

PLACE OF MEETING,

Supreme Court Room, State Capitol, Harrisburg, unless otherwise ordered.

TIME OF MEETING,

Second Thursday in May, July and November.

**Eighth Annual Report of the Secretary,
Benjamin Lee, M.D.**

CONTINUED FROM PAGE 331.

As a rule there are no considerable aggregations of population, and hence no boards of health at points where railroads enter the State. It may, therefore, be necessary for the board to establish camps of observation for suspects at several points near the State boundaries. As the people of the townships in which such camps would be located would be in no way responsible for their presence, and as they would be intended not for the protection of the people of these townships, but of the entire State, simple justice would seem to indicate that the expense of maintaining the same should fall not upon the scanty population of the townships, but upon the entire State. However that might be, the management of such camps should not be left to the people of the township, any more than that of a military camp should be in case of a riot. Public safety demands that they should be under the direct supervision of this board. Guards would be needed to enforce quarantine. It might be an open question whether they should be furnished by the sheriff of the county or the adjutant-general of the State. All experience shows that little dependence is to be placed upon the raw material of a posse. Should the necessity for such precautionary measures arise, it is manifest that the board would need a sum of ready money greatly in excess of its ordinary appropriation. It would be necessary to open a branch office with a staff of assistants solely for this work, in order that the routine work of the board, which under the circumstances would materially be augmented, might go on uninterrupted. The protection of the streams of the Commonwealth from choleraic pollution might also require considerable outlay.

The board cannot too strongly urge upon the legislature, therefore, the importance of making permanent provision for future emergencies, by the establishment of an emergency board, of which the Chief Executive of the State should be the chairman, and the appropriation of an adequate sum to be disbursed by said board under proper restrictions, and on the requisition of the proper authorities.

The only point at which such inspection was actually inaugurated by the board was Cumberland, Md., on the Baltimore and Ohio road, where Dr. J. S. Hackney, medical inspector of the Southern Tier District, was stationed for a week with the approval of the railroad company and the consent of the Secretary of the State Board of Health of that State.

LEPROSY.

The leper who has been domiciled at the Delaware County Pest House for the past two years, has recently made excursions into the neighborhood, which have caused much anxiety to the inhabitants. It is a question whether this is a matter for interference on the part of the board, of the local courts, or of the sheriff of the county.

Two new cases of this disease have been discovered lurking in the city

of Philadelphia. One of these had been for months acting as cook in a small hotel, kept by the notorious Dr. Paine of bogus diploma notoriety, who was promptly fined by the City Board of Health for this criminal infraction of sanitary law. Both cases are now confined in the Municipal Hospital, on the grounds of which a separate building is being erected for the permanent reception of cases of this disease. Thus the prophecy on which your Secretary ventured a few years since, that unless stringent precautions were adopted, and a retreat for such unfortunates were provided by the national government, every city would need its leper house, is entering at this early date on its fulfillment.

INVESTIGATION WITH REGARD TO LEPROSY IN THE UNITED STATES.

Copies of the resolution adopted with regard to the spread of leprosy in the United States, and the necessity for the National provision for the care of sufferers from that disease have been sent to the President of the United States and the Supervising Surgeon-General of the United States Marine Hospital Service.

The Secretary also visited Washington and conferred personally with the latter official on the subject, who will recommend it to the attention of Congress in his forthcoming report.

Circulars on this question have been sent to all State Boards of Health and to all prominent specialists on skin diseases, and numerous replies have been received, showing that very general interest is being awakened in the matter.

NOTIFICATION OF ARRIVAL OF INFECTED SHIPS AT THE PORTS OF NEW YORK AND PHILADELPHIA.

On the 16th of February the Secretary addressed a communication to the United States Commissioner of Immigration at the Port of New York, Hon. John B. Weber, requesting that immediate notification should be given this Board of the arrival of any vessel having infectious disease on board, on which were immigrants destined for points in that State. On the 18th of February a courteous reply was received acceding to the request. The first list was received February 21. Since then notifications have been received regularly. It will convey some idea of the immense tide of immigration which is pouring into this Commonwealth when it is stated that the steamer "Darmstadt," arriving March 24, brought 400 immigrants for Pennsylvania alone. Information thus received is at once sent to the local authorities, who thoroughly appreciate the vigilance of the State Board in thus warning them of the possible approach of infection.

A similar arrangement was made somewhat later with the Hon. John J. S. Rogers, United States Commissioner of Immigration for the Port of Philadelphia.

THE PREVENTION OF BLINDNESS.

The Board will remember that its attention was once called by the Sydenham Medical Coterie of Philadelphia to the alarming increase of

blindness, and to the fact that much of it was preventable. A communication was presented early during the present year from a special committee of the Philadelphia County Medical Society, urging the same subject upon the consideration of the Board in the following terms:

Resolved, That the State Board of Health be requested to memorialize the legislature of this State to pass a law, or to itself adopt a regulation, requiring that all cases of inflamed or reddened eyes of the new-born shall be reported to some health officer or legally qualified practitioner of medicine within twelve hours of the time the disease is first noticed.

In response to this request the following preamble and resolutions were adopted:

WHEREAS, It has been brought to the attention of this Board by two important medical societies of the city of Philadelphia, representing a large portion of the medical practitioners of that city, that from one-fourth to one-third of all cases of blindness are due to ophthalmia of the new-born, which is a preventable disease; therefore, be it

Resolved, That the following regulation be and is hereby accepted:

REGULATION IV.

Whenever in any city, borough, village or place in this State, having no health authority of its own, any nurse, midwife or other person not a legally qualified practitioner of medicine, shall notice inflammation of the eyes or redness of the lids in a new-born child under his or her care, it shall be the duty of such person to report the same to a legally qualified practitioner of medicine within twelve hours of the time when the disease was first noticed.

Resolved, That this Board recommends the passage of a similar ordinance by the councils of all cities and boroughs having health authorities of their own, or the adoption of a similar regulation by such health authorities.

A circular upon this subject, giving the reasons for the adoption of the regulation, and indicating the means to prevent blindness from the cause referred to, has been issued by the Board and circulated among hospitals and training schools.

CONSUMPTION.

Acting under instructions from the Board, the Secretary has transmitted copies of the circular on consumption to the superintendents of all penal institutions throughout the State with a letter calling their attention to the necessity for adopting certain precautions to prevent their institutions from becoming infected with the germs of this disease, and asking for statistics of the prevalence of this disease among the inmates.

Replies received up to the present time indicate that it is a rare thing for a case of consumption to be found in the smaller county jails. Returns have not yet been received from the State penitentiaries.

PENNSYLVANIA ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

As indicating the general diffusion among the people of a belief in the doctrine of the contagious and infectious character of consumption, it is

interesting to note that a society has been formed in the city of Philadelphia having for its object the prevention of the spread of this most prevalent and fatal of all diseases.

THE FLOODS AND FIRES OF JUNE 5, 1892.

Intelligence of the terrible destruction to life and property at Titusville and Oil City on the 5th of June reached the Secretary at Detroit on June 6. He at once telegraphed to His Excellency, the Governor, inquiring whether the information in his possession led him to consider that the interference of the State Board of Health was necessary or desirable, and to the mayors of these cities inquiring whether tents were needed. A medical inspection of the regions affected was also ordered, and the boards of health were asked whether they needed assistance to meet the emergency. The replies of the Governor and the other officials indicated that the local boards of health and authorities were able to cope with the emergency. This was shortly afterward confirmed by the report of Medical Inspector Woods.

On the 10th of June the Secretary visited Oil City and conferred with the Mayor and Board of Health. Accompanied by the president of the Board of Health, a careful inspection of the entire district was made, and every provision was found being made for the prevention of nuisances and care of the injured. A similar inspection of the Titusville region affected was also made a few hours afterward in the company of the president of the Board of Health of that city. Much admirable work had also been done here by the local board, but the immense area involved and the low-lying character of the district presented considerable difficulties in the way of abating the nuisances. About four hundred men were actively at work in the removal of debris, application of disinfectants, construction of drains and the opening of thoroughfares. The efficient manner in which these two boards of health had met such an overwhelming disaster afforded a convincing proof of the need of the compulsory establishment of boards of health throughout the entire State.

After carefully examining the causes of the disaster by fire in both of these instances, the Secretary was impressed with the fact that oil tanks or refineries should no longer be permitted in exposed positions on the banks of streams where they are liable to be undermined and swept away.

INSPECTION AT MEADVILLE.

While at Titusville the Secretary was requested by wire to visit and inspect Meadville, portions of which had also been flooded. The flood here had left much offensive debris, but the Board of Health had been taking admirable precautions to prevent any result prejudicial to the health of the city. The conditions at this city are somewhat peculiar as regards dangers from floods. Considerable engineering work and pecuniary outlay will be necessary and are essential to prevent constantly recurring catastrophes. The Secretary declined, however, to promise State aid in the matter. A difficulty having arisen in the City Council with regard to the authority of the Board, the Secretary sustained them in all that they had done, and advised them to continue in their important work regardless of opposition.

PROPOSED SEWERAGE OF DARBY CREEK VALLEY.

On the twenty-ninth day of June the Board made an inspection of the neighborhood of the outfall of a proposed sewerage system designed to carry the sewage of all the suburban towns and settlements on the line of the Pennsylvania Railroad between Bryn Mawr and Berwyn, with a possibility of also taking care of much of that which now flows into the Schuylkill. At the meeting in July the project received the approval of the Board, with the proviso that all solids be intercepted and cremated, or otherwise rendered innocuous, that all other details of arrangement be such as to avoid the creation of nuisances prejudicial to the public health, and also that the sewer be so located that it can be readily extended to tide water if the protection of the public health demands it.

This constitutes the first effort in this State at combined action for the drainage of a large rural area. It necessarily involves the question of the right of way already conferred on cities and boroughs for this purpose, and the Board, therefore, has thought good to suggest to the legislature the enactment of a law conferring on sewerage companies the right of eminent domain for carrying sewers through private properties.

ENGINEER INSPECTORS.

The important step has been taken during the year of establishing the office of engineer inspector. Problems often confront the board of an engineering rather than a medical character. The wisdom of the suggestion of the engineer member of the board, Howard Murphy, Esq., C.E., that such questions should be referred to engineers rather than physicians, was apparent. The State was accordingly divided into two engineer inspection districts. Mr. William H. Boardman, C.E., was elected engineer inspector of the Eastern District, which, for the time being, comprises all that portion of the State lying east of the Allegheny ridge; and Colonel Thomas P. Roberts, C.E., of Pittsburg, engineer inspector of the Western District, comprising the counties west of the same line. Both of these officers have entered upon the discharge of their duties, and the character of their reports has justified the wisdom of their appointment.

CHANGES IN MEDICAL INSPECTORSHIPS.

Dr. E. D. Payne, medical inspector of the Lycoming District, having been compelled to resign in consequence of ill health the board reluctantly accepted his resignation. His record has been that of an enthusiastic hygienist and faithful officer. His place has been filled by the appointment of Dr. Woodburn, also of Towanda.

Dr. Spencer M. Free, medical inspector of the Western Slope District, has also tendered his resignation in consequence of having moved outside of his district. The board will lose in him an intelligent sanitarian and an energetic worker. This vacancy is yet to be filled.

SPECIAL INSPECTORS.

At the request of the Borough Council and Board of Health of Coatesville, the Secretary has given one of the inspectors of the City Board of

Health of Philadelphia authority to make a house-to-house inspection of that borough.

At the request of the Philadelphia and Reading Railroad Company, Dr. Casper Morris, company surgeon, has been appointed special medical inspector to the State Board of Health for the trains and property of the company, with authority to arrest and remove persons suffering from contagious diseases, and to destroy filthy clothing, baggage, bedding and other effects found upon the premises of the company.

LEGISLATION.

Among the duties assigned by law to this board is that of suggesting "further legislative action or precaution deemed proper for the better protection of life and health." This may be done in a very few words.

The needs of the State continue as they have been ever since the establishment of the board, and as the board has pressed them upon the attention of each successive legislature :

(1) The sanitary organization of the State throughout the rural districts, so that every portion of the State may have some legally-constituted local health authority.

(2) The compulsory establishment of boards of health in all cities.

(3) The authorization and establishment of boards of health in all incorporated boroughs.

(4) Protection of the purity of water supplies.

(5) The establishment of an emergency board, with an appropriation adequate to meet ordinary emergencies; and

(6) An increased appropriation for the ordinary work of the board.

To this may be added the new suggestion made in a previous portion of this report, of an Act to confer upon sewer companies the right of eminent domain through private properties.

CONFERENCE OF STATE AND MUNICIPAL BOARDS OF HEALTH.

In accordance with a resolution of the board, the Secretary had invited and attended a conference of State and Municipal Boards of Health at Chicago, with a view to formulating a definite plan for an exhibit of official sanitary work in the United States at the Columbian Exposition, and submits the minutes thereof.

The Sixth State Sanitary Convention, held at the city of Erie in the month of March, was an occasion of much interest and profit. The annual address was delivered by Dr. Peter H. Bryce, of Toronto, Canada, secretary of the Provincial Board of Health of Ontario, the subject being "Economic Value of Sanitation." It was illustrated with charts in such a way as to make its teachings readily comprehended by a popular audience.

The National Conference of State Boards of Health took place at Lansing, Michigan.

The Secretary, as instructed by the board, presented the subject of the "Responsibility of National and State Governments in regard to the Protection of the Purity of Water Supplies." In consequence of the catastrophes at Titusville and Oil City, he was obliged to leave before the full discussion of the subject took place.

As chairman of the section on State Medicine of the American Medical Association, the Secretary also presented the question of "Governmental Prevention of Pollution of Streams" before that body.

A conference has also taken place between the Secretary, the chairman of the Committee on Water Supplies, and the Committee on Water Supplies of the Philadelphia Board of Trade, with reference to the preservation of the Schuylkill River.

It is proposed, in order to further this important object, to hold a conference at an early day at the city of Reading, to which all officials of cities and towns, and officers of water companies within the drainage area of that stream, will be invited.

BENJAMIN LEE, M.D.,
Secretary.

Meeting of the Michigan State Board of Health.

At the meeting of the State Board of Health at Lansing, April 14, 1893, the members present were: Hon. Frank Wells, President *pro tem.*; Arthur Hazlewood, M.D., Grand Rapids; Mason W. Gray, M.D., Pontiac; Prof. Delos Fall, Albion, and Henry B. Baker, M.D., Secretary.

Prof. Fall mentioned a subject of startling interest as a menace to water supplies in this State, especially at a time when cholera is expected. He stated that a prominent physician in the southern part of the State had informed him that as an easy method of drainage, in certain localities it is becoming a custom to bore down through the underlying basin of clay or rock, thus allowing filthy, contaminated water to run directly down into the underground water, which is the best source of water supply in this State. Except at the first, the water would not be stagnant but running water, and, perhaps, would not be injurious.

Dr. Baker said that although such water is not stagnant, as it would be moving on the surface and in underground streams, the dirty surface water goes directly into sources of water supply, without having undergone the usual nitrification and filtration in passing through the surface soil. He cited a case of a wealthy man in this State who bored such a hole through the clay into which to throw slops, and in that case the slops contaminated his well so that he was obliged to bring water from a distance. He mentioned an instance in Lansing where a cellar was thus drained. He said that there are people who, knowing that drainage can be accomplished by boring, will not hesitate to drain barnyards and other foul places in this way, as they do not realize the danger of contaminating their own water supply, much less the danger to the entire community. Prof. Fall said that such contaminated water might be carried long distances into the water supplies of cities. Dr. Baker said that it is believed by residents of Jacksonville, Florida, that the source of water supply of that city is in the adjoining State, Georgia. Prof. Fall was made a committee to investigate this subject, and report at the next regular meeting of the board. Newspapers can do the people a good service by calling attention to the evil here mentioned.

In his quarterly report, Secretary Baker reviewed the work done in the office, and then presented twenty-one large diagrams which have been pre-

pared for the Board Exhibit at the Columbian Exposition. One of these, accurately drawn to a scale, represents the death rate in Michigan from scarlet fever, smallpox and typhoid fever before and since the State Board of Health has been working for their restriction, and proved that it is less than half what it was from scarlet fever, less than one-fourth what it was from smallpox, and that there has been a considerable reduction in the death rate from typhoid fever. It indicates the lives saved: From scarlet fever, 7265, from smallpox, 1921, and from typhoid fever, 1671.

One diagram shows "great decrease in sickness from intermittent fever in Michigan in recent years," there being only about half as much sickness from that disease during the last five years as during the first five years of the sickness statistics, 1877-81. This decrease is attributed to the general drainage and consequent warming of the soil.

One diagram shows "very great decrease in sickness from scarlet fever in Michigan in recent years," a decrease of over half the sickness in the last five years compared with the five years from 1877-81.

One diagram shows "very great decrease in sickness from diphtheria in Michigan in recent years," a decrease of nearly three-fourths of the sickness in five years, 1887-91, compared with the five years from 1877-81.

Ten of the diagrams exhibit causal relations of meteorological conditions to several important diseases, these contributions to science being from the sickness statistics and meteorological data collected by the Michigan State Board of Health.

Secretary Baker, in his report of attendance at the International Conference of State and Provincial Boards of Health at New York, April 5 to 7, stated that "that the Conference was called to meet in New York because it is believed that about 70 per cent. of the immigrants to this country enter through the port of New York. It was called earlier than usual because of the present threatened importation of cholera, which is widely spread through Russia, and is present in other countries in Europe, and is generally believed by sanitarians as likely to be brought to this country, unless extraordinary measures shall be taken throughout this country. The several State and Provincial boards of health in the United States and Canada were well represented in the Conference. The National Board of Health of Mexico sent reports. The United States Government and the Dominion of Canada were represented.

"The International Quarantine Commission, which last summer visited and inspected the quarantine stations from Quebec to the Delaware Breakwater, submitted a report. This showed that at the time of the inspection not one of those stations was properly equipped for the most effective work. Inspection by the members of the conference revealed the fact that there has as yet been no improvement in the equipment at the quarantine stations at the port of New York. Dr. Jenkins, health officer of the port, stated that improvements are contemplated which, if made, will greatly increase the capacity of the plant for steam disinfection. He stated, however, that no disinfection of the baggage of immigrants has been done at Hoffman's Island, where the disinfecting plant is, since last October. The baggage of a few, who had been exposed to smallpox or other disease on the voyage, or whose baggage was for some reason suspected to be infected, has been disinfected on the vessel on which it came.

The conference appointed committees to formulate replies to some of the questions stated in the announcement and program. One of these committees reported as follows:

"Your committee recommends that during presence of cholera in Europe the disinfection of the baggage of all immigrants destined for this country should be required, unless disinfected at the port of departure, and that certificates therefor, showing the manner of disinfection, shall be pasted on the baggage."

This resolution was combated by Dr. Jenkins, quarantine officer at New York, and by others representing States on the seaboard, but was insisted on by the interior States, especially those like Michigan, to which, or through which, a large proportion of all immigrants go. Dr. Jenkins' proposed amendment that only baggage from ports reported infected should be disinfected was voted down, seventeen to seven. The resolution was adopted by a large majority. It is doubtful, however, if such disinfection will be done at New York, although the conference formally protested "against the continuance of this neglect."

The Michigan delegates labored hard to secure disinfection of immigrants' "baggage at New York, and other seaboard quarantine stations," and, in case that could not be had, then for a line of disinfection of all such baggage, on a line extending southward to the Ohio River from the present Michigan-Canadian line from Sault Ste. Marie to Detroit.

One committee, of which Prof. Vaughan, of Michigan, was the chairman, reported detailed plans which were adopted by the conference for a uniform system of inspection service to be established, not necessarily on State lines, in case cholera occurs in some part of this country. Some sections in these plans relate to what shall be required of railroads and transportation companies.

A Meeting of Ohio Sanitarians.

[Specially reported for THE ANNALS OF HYGIENE, by Edward T. Nelson, A.M., Ph.D.,
Member of the Ohio State Board of Health.]

A JOINT meeting of the State and local boards of health of Ohio was held at Columbus, on the 26th and 27th of January, and was of so remarkable and interesting a character as to deserve a public notice.

In 1886, when the State board was organized by act of the legislature, less than thirty towns and cities had local organizations for sanitary purposes, and these were, very naturally, the largest and most progressive of our cities. The laws on the statute books were permissive, but not mandatory. These laws have been improved from time to time, until to-day every city and town of over five hundred inhabitants must maintain a local board of health. The law on this subject has been contested in the courts, and has been sustained. As a result, we have over four hundred and thirty of these local boards, auxiliary to and in constant communication with the State organization. It was thought wise to call a joint meeting of the sanitary officers of the State for conference and acquaintance. The approach of

cholera was made the occasion. More than two hundred responded to the call. In most cases the cities were represented by their "health officers," but in a number of instances, the mayor, the president of the city council, and one or more of the leading citizens were also present. A number of the railroads of the State were represented by the president or some delegated officer. When we remember that the meeting was purely voluntary, and that each member had to bear his personal expenses, the attendance will be regarded as very remarkable. It will be impossible to give anything like a full report of the proceedings. The programme was arranged so as to give ample time for discussions, and the introduction of any topic of general interest that had been omitted by the committee who had charge of the meeting.

The regular programme was as follows:

FIRST SESSION.

Introductory Remarks. By S. A. Conklin, M.D., president of the State Board of Health.

(1) Practical Suggestions on Cholera. By S. P. Wise, M.D., member of the State Board of Health.

(2) The Disposal of the Cholera Dead. By W. F. McClean, M.D., health officer of Elyria.

(3) The Diagnosis of Cholera. By T. C. Hoover, M.D., member of the State Board of Health.

SECOND SESSION.

(4) The State's Duty in Preventing Cholera. By B. Stanton, M.D., member of the State Board of Health.

(5) Water Supplies as Carriers of Cholera. By E. T. Nelson, Ph.D., member of the State Board of Health.

(6) The Cholera Bacillus. By A. M. Blile, M.D., professor Ohio State University.

THIRD SESSION.

(7) Local Quarantine Against Cholera. By A. W. Fisher, M.D., health officer of Toledo.

(8) The Immigrant as a Factor in the Introduction of Cholera. By W. T. Miller, M.D., member of the State Board of Health.

(9) Municipal Cleanliness and its Relation to Cholera. By A. A. Kohler, M.D., health officer of Akron.

There was a general agreement as to the very strong probability of an epidemic of the disease during the present year. The quarantine measures now pending in Congress were very strongly commended, while at the same time it was felt that quarantine always gives a false security, and that it must not stand in the way of the most active and unceasing local sanitation. Only two speakers were of the opinion that cholera is an infectious disease, or that it could be carried by the air. Several members of the convention have had experience in former epidemics, either in this country or in Europe. They gave it as their opinion that cholera is not infectious, nor even contagious to a greater degree than typhoid fever, and that the source

of the disease was always polluted water or contaminated foods. The remarkable immunity of physicians, nurses and laundry women was spoken of, and explained by their use of cooked food and boiled water.

As might be expected, much time was given to a discussion of local conditions and dangers. Thus far the people of Ohio have not given sufficient attention to the character and purity of the water supplies, and instances were cited by many speakers of a pollution of drinking water hardly to be expected outside of India. The growing city of Lima, situated in the heart of the oil and gas belt, is compelled at times to draw some water from a small stream which receives the sewage of the Children's Home and the County Infirmary, less than one mile above the intake pipes. A single case of cholera at either of these institutions might be followed by a thousand in the city of Lima. The condition of the water in the shallow wells of the State is dangerous in the extreme, owing to the almost universal cesspool, with its uncased vault.

At one of the sessions the convention resolved itself into a committee of the whole, for the better discussion of a health bill now pending in the legislature of the State. The bill is the work of a committee of sanitarians, appointed more than one year ago, who have had the matter under careful study since that time. A codification and rearrangement of the existing statutes is followed by sections defining the duties and powers of the State and local authorities at the time of an epidemic, and giving them means for the expenses that must be incurred. A warm discussion sprang up over a clause giving the State board the supreme authority in matters of quarantine, and the power to review or change the force of a quarantine imposed by a local board.

For a few moments the old doctrine of "State's Rights" bristled as if the meeting was being held in Charleston or Macon. The town was greater than the State, and could better decide as to local conditions and local needs. Even little villages of five hundred inhabitants would very willingly die in the last ditch before they would admit the right of the State to enter their sacred precincts, except when invited. Peace, however, soon prevailed, and the clause was approved by an overwhelming majority. One feature of the new bill is of general interest to all parts of the country. We have in Ohio, as already stated, 430 local boards of health. These represent a constituency which is almost exactly one-half the population of the State. Thus far no health provisions, except some of a very general character, have been extended to the people living in the country outside of the incorporated villages. This bill provides that the "township trustees" shall constitute the board of health for such districts, and shall do and perform all the duties, and have all the authority pertaining to boards of health in the towns and cities. In the case of this bill becoming a law, and the prospects are very bright, the State of Ohio will have a health system extending over all its territory, and reaching out its hand of help to every home and inmate.

This joint meeting was a great success, and will be followed by others. Acquaintances have been made, and the esprit-de-corps greatly increased. Hitherto we have been scattered forces, without any real or common organization. From this time forth we shall march together.



This department is designed for the description of improved Sanitary Appliances and Medicinal Preparations introduced by patrons of The Annals. The matter is not paid for, nor can it be classed as advertising. But as the information is necessarily obtained from those who offer the appliances for sale, it is proper to say that the manufacturers, rather than ourselves, are responsible for the statements made.

Diabetine.

The necessity long since found to exist for supplying a form of carbohydrate food for the nourishment of diabetic patients, something palatable and yet entirely different from ordinary sugar, has prompted many enterprising chemists to construct various forms of nutriment that would pass through an easy process of oxidation in the system. The result has been in a majority of cases anything but satisfactory, as every intelligent person knows.

Attention is invited to a new product put on the market by Messrs. Schering & Glatz, of New York, under the name of *Diabetine*, which makes high claims as "the only innocuous and palatable sugar for diabetics."

At the fifteenth public meeting of the Berlin Balneological Society, held March 10 to 14, 1893, Prof. Leyden stated that he had made trials with Levulose (diabetine—Schering), a certain kind of sugar, and found that this product was made use of to more advantage in the human economy than cane sugar and other carbo-hydrates, and that the advantageous use was increased with the length of time the article was taken, while for cane sugar the opposite condition obtains. This result is quite satisfactory, as it proves the feasibility of improving the nutrition of patients with diabetes of medium intensity."

Dr. H. von Hebra's clinical reports, which were confirmed by many other researches and experiences, describe diabetine as a saccharine food, that can be taken freely and without injury, and most nearly approaches the ideal carbo-hydrate food indicated in diabetes.

Minkowski stated at the recent Congress for Internal Medicine in Leipzig, that the results of his research fully warrant the hope that the introduction of diabetine in the diet of diabetic patients will prove of great value.

Taking a Turkish Bath at Home

is something not every one can do. Very few, even among the wealthy readers of THE ANNALS OF HYGIENE, have fitted their dwellings with all appliances of a well-arranged medicated bath apparatus. Mayor, Lane & Co., 119 Walker Street, New York City, offer a "Turko-Russian Folding Bath for Medical and Family Use," which will doubtless commend itself to many readers, and the manufacturers invite all interested to send for a descriptive circular.

Trional.

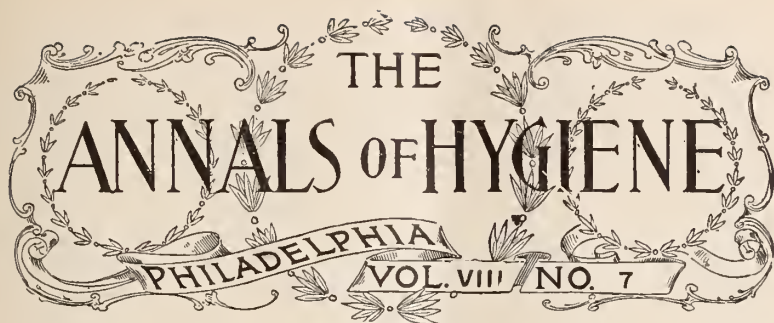
Cases of sleeplessness are of frequent occurrence in the practice of every physician, and often prove extremely rebellious to treatment. Few hypnotics and sedatives combine the qualities of efficiency with freedom from unpleasant after-effects, and aside from this, after continuous use a tolerance is established necessitating a change of remedies. Trional, a new hypnotic, to judge from careful clinical experimentation, is both safe, prompt and efficient. The usual dose is one to two grammes administered in the evening, but sometimes it is given in divided doses during the day. In cases of simple sleeplessness a single evening dose of one gramme often produces uninterrupted and usually deep sleep in from fifteen to forty-five minutes, and with the exception of slight giddiness in one instance, in a total of seventy-five cases, there were no unpleasant after-effects, such as are so frequently observed after the use of other hypnotics. In the insomnia of mental diseases the hypnotic effect of Trional was always promptly exhibited if excessive mental excitement did not exist; but even in some cases of marked non-alcoholic delirium an excellent result was obtained by the administration of fractional doses. It may be given per rectum in somewhat larger doses with as prompt effect as by mouth—a point of importance in cases of severe mental disorder. Another advantage is that patients do not become addicted to it even after continued administration for a long time. Aside from cases of sleeplessness due to severe bodily pain, acute alcoholism and severe mental excitement, Trional seems to be a hypnotic efficient, safe, prompt and pleasant in its action and a valuable addition to the materia medica. Write to W. H. Schieffelin & Co., New York City, for further information.

Julius Fehr's Talcum Powder.

This powder was introduced to the medical profession in 1873, and has steadily grown in favor from that time until the present. Its popularity is due to the fact that Dr. Fehr has aimed to maintain a standard of absolute purity in its preparation. The materials used are of the best. It possesses antiseptic, antizymotic and disinfecting properties, and the yearly increasing sales demonstrate most clearly the high estimation in which it is held.

Medicine Cases.

The H. K. Mulford Company, 2132 Market Street, Philadelphia, manufacture a medicine case which is a marvel of compactness. It is made in various sizes, the smallest being $7\frac{1}{8} \times 3\frac{3}{4} \times \frac{7}{8}$ inches, a convenient size for the pocket. This case contains twenty-four vials, filled with an assortment of the H. K. Mulford Company's tablets and triturates. Such is the popularity of these cases that 15,000 of them have been sold to physicians all over the country in the short time they have been on the market. The sizes run up to and include a buggy case, which contains the resources of an average drug store.



COMMUNICATIONS.

The Meeting of the American Public Health Association.¹

BY BENJAMIN, LEE, A.M., M.D.,

Secretary of the State Board of Health of Pennsylvania.



IN accordance with the instructions of the State Board of Health the Secretary attended the annual meeting of the American Public Health Association, in the City of Mexico, from November 29 to December 2, 1892, inclusive. As the first occasion of a meeting of this important representative association in a country whose people be-

long to a Latin race, and speak a Latin tongue, it was one of exceeding interest and importance. As Dr. Felix Formento, of the Louisiana State Board of Health, the honored and eloquent president of the association, well said in his address: "The intelligent transfer of the scene of our debates far beyond our boundaries to the capital of our friends and neighbors, is the first step of the scientific unification of the whole American continent." For although in point of fact it was not the first international health congress, as he declared, since we had already met in the dominions of her Britannic majesty, it was the first at which the members from the United States felt themselves to be among a strange people, and on foreign soil. The fact that the invitation to hold the meeting at the capital of the neighboring republic emanated from the central government of the nation lent a dignity and an

¹ Report of the Secretary as delegate to the annual meeting of the American Public Health Association, at the City of Mexico.

official importance to the proceedings which they never before possessed. Dr. Formento would have been justified in going farther than he did, and declaring that not simply from a scientific, but a political point of view, this meeting was the starting point of a new era of cordial good feeling between the sister republics. The intelligent portion of the population appeared fully alive to the importance of the opportunity. They recognized that this body represented, as none other which had ever visited them, the intelligence, the science, and the public sentiment of all portions of the two great English-speaking countries which shared with them the possession of the continent. Their demonstrations of respect and welcome were such as pertain to a warm-hearted, impulsive southern people, and quite took the delegates by storm. At important railroad stations, all the way from the Rio Grande to the City of Mexico, trains were met by the governors of the provinces, and representatives of legislatures, who delivered addresses of welcome, and hailed our coming with bands of music, flowers, and waving banners. Arrived at the capital similar demonstrations awaited us, and we were whirled away to our hotels in superb private equipages, with liveried attendants. While in the city the entertainments offered to the members were of the most brilliant and sumptuous character. Especially invited to be present at the inauguration of President Díaz, they were accorded the precedence at the reception at the National Palace which immediately followed. The reception by the Ayuntamiento, in the Municipal Palace, in the name of the City of Mexico, illustrated by the fairy-like illumination of the grand Cathedral on the opposite side of the plaza, was on a scale of great magnificence, while the banquet on the terraces of the castle of Chapultepec, the residence palace of the president, over which he presided in person, was an occasion never to be forgotten. Equally lavish in its preparation, and of great interest from a sanitary point of view, was the forty-mile excursion to inspect the new drainage works of the Valley of Mexico—terminating in an entertainment at the quaint old City of Zumpango, our entrance into which was celebrated by salvos of artillery, chiming of church bells, music, and a turn out of the whole population in holiday attire. The open-air evening concert by the united bands of all the regiments stationed at the capital, numbering 150 thoroughly-trained musicians, varied by a fine pyrotechnical display, was also a compliment of unusual character, and was highly appreciated.

I have dwelt upon this feature of the meeting because it appeared to me of profound import, as showing first the friendly feeling of the Mexican government toward our people, and secondly, and more especially, as indicating the appreciation on the part of the government of the significance of our mission, and the value which it sets upon the work of scientific sanitation and hygiene. When it is remembered of how recent origin is modern sanitation, and that numbers of delegates present were men who when in full maturity had assisted at its birth, such a recognition of its importance by a great nation must be regarded as of no mean significance as indicating the wondrous rapidity with which its doctrines have spread. Few of the delegates were probably prepared to find a National (Superior) Board of Health, endowed with ample powers, established in a suite of fifteen grand apartments, and equipped with all the modern appliances in the way of laboratories and apparatus, including a Pasteur institute for the treatment of rabies. In this particular, as in the cleanliness of the streets of the capital, and the excellence of the police regulations, food was found for reflection by those who are inclined to boast of the superior civilization of our own country. When we add to these public demonstrations the open-handed hospitality of private individuals, and the eagerness of all scientific, medical and charitable institutions to throw open their doors and thoroughly acquaint us with their modes of administration, it will be understood that the reception accorded the association was not of a merely perfunctory character, but sprang from a hearty sympathy with, and intelligent appreciation of, its objects. At the generous reception given by General de Carmona, at his superb hacienda of "La Soledad," the distinguished host uttered a sentiment which touched a responsive chord in every heart. "Years ago," he said, "an army invaded our country from the North, bristling with bayonets, and heralded by the booming of cannons sent on an errand of destruction. Now we are confronted with another army. But how different its mission. The olive branch of peace is its only weapon, and its object is to teach us how to save life, and not to destroy."

The programme which the Committee of Arrangements had laid out for its guests was truly colossal. For eight days, from 8 A.M. to midnight, there was not an unoccupied moment. Of course, no one individual could participate in every function. But what one could not take part in another could. Schools, asylums,

hospitals, museums, picture galleries, palaces, all claimed attention, and well repaid it when bestowed.

The sessions took place partly in the hall of deputies and partly in the chapel of the preparatory school, originally a Jesuit college. Every Mexican who desires to study a profession is compelled to take a five years' course of classical and scientific instruction in this school. Their physicians, therefore, are all men of education and culture, another feature which our own country may well imitate.

It was a curious and suggestive sight to see the members ranged around the sides of this lofty room, occupying the elaborately carved stalls of the monks, and listening to the reading of papers in a foreign language, read from the towering pulpit from which many a sulphurous invective against the encroachments of science had been hurled by frocked and hooded friars. That such papers could be listened to understandingly was due to the fact that all of the papers delivered in Spanish had been translated into English and distributed just before their presentation, and *vice versa*. Hence, while the sonorous tones of the Spanish fell upon unappreciative but not displeased ears, the eye enabled the American listener to grasp the thought of the speaker. Few of the northern visitors, however, were able to sit out any single session, in consequence of the chilliness of the building in which they were held. The Mexicans have a proverb that "the sun is the Mexican stove," and on this stove they rely entirely. Those who are accustomed to artificially heated rooms are compelled to constantly seek the rays of the Mexican stove in order to maintain their animal heat.

Owing to this and other causes many of the visitors suffered from intestinal disturbances, while others found their respiration and their heart's action seriously disturbed by the rarity of the atmosphere at the altitude of nearly 8000 feet above the level of the sea. Added to these embarrassments the fact that while papers could be presented to the eye synchronously with their delivery, the process of vocal translation was necessarily a slow and tedious one, and there will be no difficulty in understanding that, while many valuable papers were read, the discussions lacked the spontaneity and brilliancy which ordinarily characterize those of the Association. It was owing to this fact, doubtless, that the able report of Dr. Walcott, of the Massachusetts Board, formerly president of the Association, on the Management of

Cholera should it reach the United States during the coming summer, elicited so little comment and led to no decisive action. This is greatly to be regretted. The programme, was a full and interesting one. It would only weary your readers to repeat it. At the time of the meeting typhus was rife in several cities. So prevalent and fatal was it in the mountain mining city of Zacatecas that the authorities deemed it advisable that none of our party should leave the train there, and the intended reception was given up.

The subject of typhus in Mexico was introduced in the conference of State boards of health a year ago by your Secretary with a view of determining whether its prevalence in that country made unusual quarantine precautions necessary on the border. The occasion appeared to him favorable for obtaining more definite information on this subject. He therefore introduced the following resolution, which was seconded by Dr. W. Mallet-Prevost, of the city of Mexico, and passed unanimously:

“Resolved, That the Superior Board of Health of Mexico be and is hereby requested to prepare a memorial on the nature, characteristics, etiology, mode of preparation, bacteriology and prophylaxis of the contagious fever now prevailing in certain towns in Mexico, and to present the same to this Association at its next annual meeting.”

The fact that three cases of typhus have occurred in the city of New York during the past two months, directly traceable to importation from Mexico, would appear to amply justify the call for this inquiry.

During the outbreak at Zacatecas, up to the time that the delegates returned to the United States, no less than seven physicians had fallen victims to the disease, a terribly convincing proof of its excessively contagious character.

Notwithstanding the immense distances which the majority of the members were obliged to come, the meeting was largely attended. Its effects upon the city and nation of Mexico must prove beneficial and far-reaching.

The following members were elected officers for the ensuing year:

President, Dr. S. H. Durgin, of Boston, Mass.

First Vice-President, Dr. Eduardo Liceaga, of Mexico.

Second Vice-President, Dr. Emanuel P. Lachapelle, Montreal, Canada.

Secretary, Dr. Irving A. Watson, Concord, N. H.

Treasurer, Dr. Henry D. Holton, Brattleboro, Vermont.

Three new members of the Executive Committee, Drs. William Bailey, of Louisville, Ky., Henry F. Hoyt, of St. Paul, Minn., and Mr. Robert F. Gayol, of Mexico.

The next meeting of the Association will take place, in accordance with a resolution adopted at the previous meeting in Kansas City, in the month of October in the city of Chicago, and will partake of the nature of a World's Sanitary Congress.

The Ground of Safety.¹

BY R. C. KEDZIE, M.D.,

Member of the State Board of Health of Michigan.



WHEN we speak of *our mother earth* it is a vigorous and suggestive expression. Sprung from the dust, we live upon her bosom and draw our supplies from her ample stores; and when "life's fitful fever" has burned itself out, our ashes drift back to their original source. Let us, then, humbly accept the fact that as regards our physical existence we are of the earth, earthy, and that we shall never free ourselves from these fetters of clay till mortal shall put on immortality.

Though we tread the soil beneath our feet, yet in an important sense it is for us the physical basis of life. While water is the type of treacherous instability, the solid earth represents confidence and safety; to have our feet on solid ground is to be secure. In times of flood and shipwreck our confidence in *terra firma* is fully brought out. Yet this implicit trust may be shaken. It is said that no form of danger begets such overwhelming terror in man and beast as the earthquake, when the very *ground* of our security becomes a source of peril. We tremble before the thunder-bolt and tornado, we turn pale under the withering wings of the pestilence, but the soul dissolves in terror with the heaving throb of the earthquake. Thus, under uncommon circumstances the *ground of safety* has conditions, and is to be accepted with limitations.

¹ A paper read before the American Public Health Association at its annual meeting in the City of Mexico, November, 1892.

The noblest physical fact in nature is life, for it is the gift of God. If life is noble then the physical conditions of life cannot be ignoble. To turn his thoughts for a time to the physical conditions of life is wise in man, because continuance in life is conditioned upon and limited by its physical surroundings. The ordinary conditions which modify and even limit the common life of the human race demand serious consideration. Common life is a tame and uneventful theme for discussion. The uncommon life of the great, of heroes and statesmen, of generals and admirals who scourge the earth and vex the sea, the rich and powerful who live the uncommon life—this has a fascination for us all, in comparison with which common life seems mean and dull, just as our eyes light up as we gaze upon the gorgeous colors of the rainbow, forgetting the common light of day. But it takes all the colors of the rainbow to make the common light of day, so all heroism and excellence go to make up the common life. In its entirety and intrinsic value, common life is more valuable than all the chivalry, romance, oratory and poetry, just as the ocean is grander and weightier than all the clouds which spring from her bosom only to float in lofty disdain through the fields of air. All honor to common life because it is common, and a reverent study of the conditions for its betterment.

Next to life the most precious possession is health—the harmonious co-ordination of all internal and external physical forces to secure the well-being of the individual. The conditions of health have been laid down as pure air, pure water and pure food. These three “P’s” are prime factors of health. Pure life may well be added to the list, and even then all the conditions of healthy living have not been named. Atmospheric temperature and moisture are controlling forces in climate, and have intimate relations to health. The fact that the human body amid widely conflicting changes of temperature, must still maintain the heat of 98° F., that to fall much below or rise much above that temperature causes disease, and if prolonged may cause death; and the further fact that many processes of secretion, excretion and assimilation are delicately balanced against each other to obviate the effect of marked changes of temperature, all indicate the controlling influence of temperature over health and even life. One writer has tersely said, “Heat is life, cold is death.”

THE SOIL, IN RELATION TO HEALTH.

Since the soil must affect the composition of the air overly-

ing it, has a profound influence upon the water contained within it, and has a marked control over local temperature, it becomes evident that the soil and its physical condition must have a marked influence on the health of the inhabitants.

SURFACE DRAINAGE.

In Michigan the drainage of swamps and marshes, removing all stagnant surface water, has been so promotive of the general health that no one now questions its benefit. In a State where one-ninth of the land was indicated upon the original surveys as swamp, the benefit of surface drainage was most obvious. Within my own recollection the malarial diseases of my State have been reduced one-half, and the most potent factor in this reduction was drainage of swamps. No law ever placed upon our statute book has been productive of more good and less evil than the law providing for compulsory drainage, where each land owner was made to bear his just part of the expense, and no churl could block the draining of a whole neighborhood because he chanced to control the outlet. This law has paid the State tenfold the cost by reclaiming a large area of once worthless land, and it has paid a hundred-fold in protecting the public health.

UNDERDRAINAGE.

Surface drainage needs no advocate to-day, and I call your attention to a form of draining equally necessary, but the need for which is not so obvious. I refer to the underdraining of soils whose surface appear to be reasonably dry, but whose deeper recesses are full of stagnant water. This *ground water*, as it is called by the Germans, is never to be mistaken for soil moisture or water held in the soil by capillary action, but is the free water of the soil, which will flow under the action of gravity. This ground water diminishes in a marked degree the agricultural capabilities of the soil, reducing the temperature, preventing soil oxidation, arresting the elaboration of plant food and preventing the spreading of the roots in the soil, because the roots of most cultivated plants will die in stagnant water. I do not propose, however, to discuss the agricultural value of soil drainage.

GROUND WATER AND HEALTH.

The influence of ground water on health is even more important than the influence on crops. It matters not how fertile the

oil may be, if the farmer by reason of sickness is unable to sow the seed and gather the golden grain. The soil that cannot raise life-supporting crops may yet procure death-dealing disease. The careful researches of Pettenkofer, of Germany, of Bowditch, of Massachusetts, and many other sanitarians, reveals the close relation between the prevalence of pneumonia, consumption, and low forms of fever, and the approach of the water line to the surface of the soil. An investigation into the causes of an outbreak of diphtheria in New York, in 1872, brought out the fact that many of the old water courses and natural springs had been filled in years before, without making provision for draining the soil, and the disease seemed to be especially prevalent along the lines of those old water courses. In an outbreak of cholera in Dublin, in 1866, Dr. Mapother says two-thirds of the deaths took place on or near the old water courses that had been converted into sewers or filled up with mud. Objection may be made that these diseases are caused by specific germs, yet these germs can propagate only in a suitable soil, and they find this in a body weakened by unhealthy surroundings.

I call special attention to the influence of ground water because people are only beginning to realize how profound is the influence of ground water on the public health. This influence is exerted directly in three ways:

- (1) By making the soil and the air above it cold.
- (2) By making both soil and air damp.
- (3) By generating malaria.

Indirectly the ground water is the predisposing cause of a large number of diseases.

Let us have a little dry discussion on the subject from a meteorological standpoint, using as data the following table of average rainfall by months, at the Michigan Agricultural College, for thirty years past.

MONTHLY AND ANNUAL RAINFALL.

Rainfall in . .	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Inches	1.86	2.11	2.56	2.40	3.08	3.77	3.35	2.81	3.10	2.59	2.23	1.96
Millimetres. .	47.244	53.594	65.024	60.960	78.232	95.758	85.852	71.374	78.740	65.786	56.642	49.784

Year, 32.85 inches ; 838.390 millimetres.

This is the average rainfall in central Michigan. When we speak of so many inches or millimetres of rainfall we seem to be dealing with small quantities of matter, but the gross amount is really large; thus one inch, or 25.4 millimetres, of rainfall means 112 tons of water to the acre, and the annual rainfall at the College exceeds 3600 tons per acre.

The water which thus falls in rain may be disposed of in three ways:

(1) Used up by growing plants and evaporated by their leaves and stems.

(2) Flows away, either over the surface, or by subterranean channels.

(3) Evaporated from the surface of the soil.

Any remaining portion will be left in the soil as ground water.

LOSS OF HEAT.

Let us follow our rainfall in these several ways. The rainfall for six months, April to October, is eighteen and one-half inches. Suppose an acre is planted to some crop that will produce twenty tons of vegetable matter, assume Knop's estimate that the crop will evaporate from its leaves during the period of growth thirty-six times its weight of water; then 720 tons of water—say six and one-quarter inches of the rainfall—will be used up by the growing crop, leaving twelve and one-quarter inches to be disposed of by flowage and evaporation. Suppose that by the combined action of these two agents six and one-quarter inches additional of the semi-annual rainfall is disposed of, and the remaining six inches would flow away if subterranean channels were present; otherwise this mass of water can only be removed by evaporation. But evaporation is a powerful heat-consuming process. To evaporate one pound of water consumes enough heat to raise the temperature of five and a half pounds of water from freezing to boiling point. The evaporation of such a mass of water lowers the temperature of the soil to a surprising degree, with corresponding loss of the vital forces. To make good this loss of heat by unnecessary evaporation, and restore the normal temperature of such a soil would require the heat caused by burning fifty-six tons of coal per acre. No wonder the farmer calls such a soil *cold*. To remove this water by flowing instead of evaporation will be a large addition to the available

temperature of the soil during the growing season. Every tile that discharges five tons of water a day for six months saves an amount of heat equivalent to seventy-five tons of coal.

CONSERVATION OF HEAT.

Let me vary the illustration for the sake of emphasis, because the loss of heat by evaporation and the saving by drainage is so important that it cannot be placed in too clear a light. Suppose that a tile drain discharges constantly for six months a stream of water whose cross-section is one square inch, and velocity two and a half miles an hour, how much coal will be required to evaporate the mass of water thus discharged? More than a thousand tons! Suppose the drain discharges for only six weeks of this period, and is dry the rest of the time, this six weeks' drainage would save the heat equivalent to 250 tons of coal. It is a physical necessity that a water-drenched soil should be a cold soil during our so-called warm season. The evils springing from this cause are active all the year, but are more manifest in spring and early summer, the period when tile drains would be most active. It is at this season also that animal and vegetable life alike demand warmth as they shake off the shackles of winter.

CHILLED AIR.

But the evaporation of so much water producing cold renders the air over such a soil *damp and chilly*. This result is a physical necessity. This damp and chilly atmosphere has a more serious influence than the simple feeling of discomfort. It has a most depressing influence on the human system, lowering its tone, enfeebling the vital powers, and acting as the predisposing cause of a long list of diseases, some of them the most destructive and incurable known to medicine. The depressing influence of the dampness and chilliness of water-soaked soil is not to be likened to the effect of an occasional wetting, as when we are caught in a shower. The chilly dampness of the undrained soil is persistent and unrelenting, dragging us down with its cold fingers at all hours, at "noon of day and noon of night," as if we toiled and rested, waked and slept in a perpetual drizzle of cold rain. It may seem a small force at first, but its persistent, untiring, and relentless pull tells upon the strongest at last, like the invisible fingers of gravity, which finally drags down all to a common level, whether towering oak or lordly hall. This depressing influ-

ence is not developed suddenly and distinctly; an hour, a day, a month may show no marked deterioration, else men would flee from such places as from a plague spot; but silently and secretly the sapping and mining go on till the explosion comes in sickness, suffering, and the sleep that is eternal.

SOIL BREATH.

There are certain other conditions secured by drainage of the soil which are essential to the health of the inhabitants, and one of these is aeration of the soil, or the passage of air through the pores of the soil. The air is entirely excluded from water-soaked soil; the entrance of air is prevented, and all interchange between the air and soil—all *soil breath*—is prevented. Have you ever thought how *everything breathes—animate and inanimate alike*? You inspire and expire air continuously, and thus keep yourself in good condition, and so do your garments. The air penetrates every fibre of your wardrobe, passing in and out, and carrying out something it did not carry in. If your clothing was impermeable to air you could not tolerate it for an hour. The invisible waves of air wash and purify you every hour.

Let me illustrate this: I cover the bowl of this tobacco pipe with the skirt of my coat, and bringing the stem of the pipe before the candle flame, you see I can easily blow air through several thicknesses of cloth, and sway the flame by the current of air. I do the same thing with buckskin, a felt hat, leather, and everything we wear except India rubber.

If you suppose your clothes do not breathe place them in an air-tight box, and strangle them for a few months, when the musty smell will convince you that your clothes must breathe to remain sweet and wholesome. Even the solid bodies, such as wood and stone, are still washed and infiltrated with air. Here is a stick of red oak a foot long, and you see I can readily blow air through it. Here is a roll of mortar, such as masons use in plastering walls, and you see I can, with the slightest effort, blow air through six inches of dry plaster.

Not only can the air pass through these bodies, but it does pass under natural conditions, and *plastered walls breathe*. In plastered rooms where the walls have been left undisturbed for some time you see the position of every beam and joist, and even the lath, by the lighter color of the wall. The part of the wall occupied by the plaster only is more permeable by air, which, in

passing through leaves the dust behind, forming a brown streak. The air holds a fine dust in suspension at all times, which dust will be filtered out and left behind when this air passes through a plastered wall; where the air passes most rapidly the most dust will be deposited on our filter, and where less air passes a corresponding less amount of dust will be deposited; the solid beams and joists prevent the escape of air from the plaster; and thus limit the amount passing through the wall surface next them; the lath will to less extent obstruct the passage of air. Thus a glance at our *wall filter*, especially if it has been long in use, will enable us to determine the position of all the frame work of the room, concealed by the plaster until revealed by the tell-tale dust.

Let me digress for a moment to speak of this subject of wall respiration, and point out how admirably a plastered wall is fitted to make the walls of a healthy dwelling, *because it permits the free passage of air, without causing draughts or unhealthy currents*. Let us see how this wall-respiration may be affected by some common practices. I am often asked, what is the influence of wall paper on the healthfulness of a room? Let us test this question by seeing whether air will readily pass through wall paper. I place a piece of wall paper over the bowl of this pipe and try to blow air through it; you see the flame is only feebly swayed, but if I use this filter paper in the same way I readily blow out the flame. The sizing used to lay on the colors of wall paper fills the pores of the paper so as to nearly prevent the passage of air, even when we blow forcibly; but with the additional paste used to fasten the paper on the wall the papered wall becomes impervious to air. Over the plastered mouth of this pipe I have pasted some thin wall paper; it is now dry, but you see I cannot blow the least air through it. *A papered wall is a strangled wall so far as wall-respiration is concerned*. When a wall is calcimined, the whiting and coloring material being laid on with a solution of glue, the wall becomes impermeable by air. Here is a pipe, the mouth of the bowl filled with mortar, and this covered with calcimine; it has been thoroughly dried, but only a minute trace of air can be forced through it. The same is true of a painted wall. Here is another pipe filled with water; I have very thoroughly washed the exposed face of the mortar, applying two coats of whitewash; yet you see I can blow air through it nearly as easily as through rough plaster.

The amount of air that will pass through this diminutive surface is small, but when we come to apply it to the dimensions of a room it becomes large. The experiments of Professors Marker and Shultz show that the passage of air through brick walls is by no means difficult. The difference of 20° F. in temperature, between out-door and in-door air, will cause the passage of about eight cubic feet of air each hour through every square yard of wall surface made of brick.

The soil also breathes. Under proper and sanitary conditions the air passes in and out of the soil with every motion of wind. You will be surprised to see how readily air may be made to pass through soil. Here is a jar seventeen inches high filled with compact, dry soil, the top closed with a doubly-perforated cork; through one hole a glass tube passes to the bottom of the jar, but terminates above in a horizontal jet; through the other hole a tube passes to the space above the soil. On blowing into this tube gently you see that the air passes down through fourteen inches of soil, because it escapes freely at the horizontal jet of the other tube, as is shown by blowing the candle flame before it.

WATER STOPS SOIL, BREATH.

But all this is changed in the presence of water in these materials. If the walls of the house are wet the passage of air is prevented. I wet this half inch of plaster and you see I cannot force the air through it. In the same way, if the soil is drenched with water the passage of air is prevented. I have here a bottle filled with soil saturated with water, and you see how the passage of air is prevented—that the air will pass through seventeen inches of dry soil easier than through four inches of wet soil. Indeed, the air will not pass at all through this thin stratum of wet soil, but will readily pass through this thick stratum of dry soil. You thus see that *a drenched soil is a drowned soil*; that all the conservative influences secured by the interaction of soil and air are cut short by the presence of ground water. You see that such a soil must be unhealthy aside from the cold and damp quality of air which overlies it, though these are themselves prime factors of disease.

SANITARY DRAINAGE.

Drainage on the large scale for sanitary purposes is almost unknown. Most of our knowledge on this subject is derived

from drainage undertaken for agricultural purposes. But whatever the purpose for which drainage is undertaken, the benefit to the public health is always pronounced and unmistakable. Governor Porter, of Indiana, in his address of welcome to this Association in Indianapolis ten years ago, referred to the benefits of sanitary drainage in these words: "Underdrainage has everywhere been followed by a great lessening of sickness, and intermittent fever, once so common, has become so rare that it is a good deal less prevalent than in some of the oldest States. Our laws relating to drainage have been recently much improved, and a disposition to relieve the soil in every portion of the State of all excess of moisture tending to lessen its productiveness and to bring on sickness is everywhere evident."

DRAINAGE OF DWELLINGS.

If the fields require draining much more the ground for the dwelling. The house you propose to make your home and live in, you surely would not place over such a death-trap as a water-logged soil. The ground which is to be the site of a house should be free from stagnant water, both the surface soil and the subsoil. If you do not *know* that the subsoil is dry, dig down eight to ten feet and see if the hole remains dry even if no drought prevails. If water filters into the excavation, remove it by thorough drainage as the first condition for a healthy dwelling.

Some persons assume that a sandy or gravelly surface insures a dry subsoil, and that it is difficult to secure a satisfactory foundation on a clay soil. Both assumptions are erroneous; the porous surface soil may have a water-soaked subsoil, and the stiff clay may be made dry and safe by under drains. A tract of land in the suburbs of Detroit was so wet and swampy that it was supposed to be nearly on a level with the river, though it was in reality seventy feet above the river. During the wet season it was a preserve for frogs and mosquitoes, and during the dry season the baked and cracked soil seemed to be gaping and yawning with ague and fever. It assuredly seemed an unpromising spot for human habitations. Some enterprising capitalists undertook its reclamation, and sank sewers ten feet below the surface with laterals for every cellar, the whole serving both as surface and subsoil drains. The tract has been built up into a prosperous and healthy portion of Detroit. Examples of this

kind might be quoted by the hour. But when houses are built upon retentive and water-soaked soils while no means are employed to draw off the ground water or ward off its effects, the harvest is sure, though it may be slow to ripen.

THE MARCH OF EVIL.

To the thoughtful mind one of the saddest sights is the endless succession of evils arising from preventable causes. In his inaugural address as Lord Rector of the University of Glasgow, John Bright drew a striking picture of the endless procession marching on through successive generations of ignorance, impoverished and embruted men, with their sad-eyed and hunger-pinched wives and children, all continued by the enormous taxes imposed to maintain the conditions and appliances of successful war in times of profound peace. In a less dramatic but no less true light we may draw the lineaments of physical evil, casting its long shadow down the corridors of time. We have histories of races and dynasties, their rise, progress and decline, the causes which brought them into prominence and the forces which brought them to their downfall. Why should not a soil have likewise a history of its own and take on a personality as truly as a race? Let us scan the features of such a farm and follow the history springing from its inherent qualities. The surface is somewhat level or gently undulating, the soil a tenacious clay, strong in the elements of enduring fertility if the physical conditions are properly adjusted. The natural drainage is very slight except that much of the surface water can run off by overflow, but the tenacious quality of the soil prevents all deep drainage; the deeper soil is water-soaked in spring and early summer, and at other times when heavy rains fall; gate and fence posts are heaved by the frost, winter wheat and clover are half uprooted by the same force. Work is late in the spring because the soil is cold and wet, crops are slow to start and slower to ripen. The farmer "has a hard row to hoe." A hopeful and cheerful spirit is conspicuously wanting because he has generally poor success with his crops, "bad luck," and because he has the continuous depression of poor health. The furrows seam his cheeks early, his shoulders stoop when he should stand erect in manhood's prime.

Indoors the wife soon fades; the bloom and laugh of happy girlhood give place to the chronic invalidism of motherhood.

Children are born only to die, or linger on in joyless ill-health. The family is finally blotted out, unless a surviving son may hand down this heirloom of sorrow to another generation, when the farm passes into other hands to repeat the same story. And thus we see in hopeless succession the generations of joyless owners pass before our eyes. The doctor, the undertaker and the sheriff enter in succession to shift the stage scenery, but the same sad drama goes on with little variation.

If nature had only planted a gravel bed under his whole farm, outcropping on some streamside, so the cold waters might laugh and sing on their way to their home in the sea, thus warming up his soil to early fruitfulness, and warming up his soul to the real joy that springs from hope and health, bringing light and laughter to the housewife by letting the tinkling spring-drop replace the scalding tear-drop, how changed the history of such a farm! Competence, and even abundance, come from the grateful returns of his well-conditioned soil, as the earth teems with her harvests. Health comes to crown the mercies of the year. His children rise up to call him blessed instead of beckoning him with their shadowy fingers to the spirit land.

Is all this a figment of the imagination? Can you not tell of farms where many of these features can be traced in the water-soaked soil, but finally reclaimed and regenerated by thorough drainage?

Let me close with an illustration given me by the late Bishop Haven:

Two brothers in Vermont, of strong and vigorous stock, and giving equal promise of a long and active life, married wives corresponding in promise of future activity. They both had chosen the healthiest of all callings—farming. One of the brothers built his house in an open and sunny spot, where the soil and subsoil were dry; shade trees and embowering plants had a hard time of it, but the cellar was dry enough for a powder magazine; the house in all its parts was free from dampness and mold, there was a crisp and elastic feel in the air of the dwelling. The farmer and all his family had that vigorous elasticity that reminds one of the spring and strength of steel. Health and sprightly vigor is the rule and sickness the rare exception. The farmer and his wife, though past threescore, have yet the look and vigor of middle life.

The other brother built his house in a beautiful shady nook,

where the trees seemed to stretch their protecting arms in benediction over the modest home. Springs fed by the neighboring hills burst forth near his house and others by his barns; his yard was always green even in the dryest time, for the life blood of the hills seemed to burst out all about him in springs and tiny rivulets. But the ground was always wet, the cellar never dry, the walls of the room often had a clammy feel, the clothes mildewed in the closets and the bread moulded in the pantry. For a time their native vigor enabled them to bear up against these depressing influences; children were born of apparent vigor and promise, but these one by one sank into the arms of the dreamless twin brother of sleep under the touch of diphtheria, croup and pneumonia. The mother went into a decline and died of consumption before her fiftieth birthday, and the father, tortured and crippled by rheumatism, childless and solitary in that beautiful home which elicits the praises of every passer-by, waits and hopes for the dawning of that day which shall give him back wife and children, an unbroken family and an eternal home.

"Look on this picture, then on that."

Malarious Localities; How They May Be Rendered Salubrious.¹

BY CHARLES SMART, M.D.,
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DESIRE to bring to your notice an interesting point in the recent medical history of one of our military posts. Before doing so, however, it may be well to recall the precise state of the sanitary question which seems to be definitely settled by the medical record of this post.

Nearly twenty years ago, while investigating the seasonal differences in the water supply of Fort Bridger, Wyoming, I found that its impurity always coincided with the period of prevalence of remittent fevers. This, alone, would have proved nothing as to any causative relationship; but certain other con-

¹Read at the recent meeting of the American Public Health Association in the City of Mexico.

siderations tended strongly in this direction. The post was situated at an altitude of 7000 feet. The maximum temperature of its hottest months was 87° F.; the mean 65°. No marshes were to be found in its neighborhood, and the stream which ran through it had a good fall, rapid current and high banks. Troops from Florida, imbued with ague, speedily recovered their health and spirits in its invigorating mountain climate. It certainly was a non-malarious station, and yet whenever the organic constituents of the stream, which supplied the drinking water, were such as to yield high rates of albuminoid ammonia, remittent fevers became prevalent. Many other facts and experiences entered into the argument to prove the causation of these fevers by the water supply, but it is needless to recapitulate them here, as they are given in full in a paper on "Mountain Fever and Malarious Waters," published in the *Medical Journal of the Medical Sciences*, January, 1878. This paper met with favorable comment at the hands of Prof. DeChaumont, who made an abstract of it for the British Army Medical Report, and instanced some investigations in the high lands of India that seemed to sustain the theory of malarious waters.

Nevertheless, in this country the paper made few converts. Our medical men, particularly in the South, where remittents are endemic, were pervaded with the idea of an ærial poison generated in the soil by the combined influence of heat and moisture on its organic matter, and exhaled therefrom, during the hours of darkness, low-lying, creeping over the surface, wafted by the winds, but readily dissipated by the warm rays of the sun. Exposure to malaria accounted for all the cases; and if, in some instance, the source of the malarial emanation was not discovered, the failure was attributed to a want of thoroughness in the investigation. Similar views prevailed in Europe, where, in the search for the exhaling surface in obscure cases, even the garden mould in flower-pots on the bedroom window sill was convicted of guilt by so great an authority as Tommasi-Crudeli.

Malarious waters usually exist in malarious districts, where all cases of malarial disease may be readily attributed to the ærial miasm. It is, therefore, difficult to prove the relationship of cause and effect between the impure water and the disease following its use. During my service with the National Board of Health I had a number of experiences which strengthened my belief in the theory of water causation. For instance, when

examining the cisterns of New Orleans, La., a former president of this association, Dr. C. B. White, brought me a water sample suspected to contain lead. I reported it to be a cistern water free from lead, but so charged with organic matter as to be equivalent to swamp water, and hence dangerous in view of remittent fever. Having given this opinion, I was informed that the cistern was situated in the well-paved and non-malarious part of the city, and that the owner of the premises, a woman who used no other water and who had not been away from the vicinity of her home for many months, was then dangerously sick with remittent fever. The suggestion of lead in the water was made merely to keep the analyst ignorant of the real object of the inquiry, which was whether the character of the water would account for the otherwise unaccountable presence of the fever.

The repetition of such experiences led me to regard the occurrence of remittent fevers in cities supplied with surface water as due to malaria in the water, just as those of Fort Bridger were due to the organic impurity of the stream which was its source of supply; and at the meeting of this association in Detroit, Mich., in 1883, I had the honor to invite attention to the subject in a paper entitled "The Prevention of Malarial Disease," showing the probability of the existence of the malarial cause in such waters and the possibility of removing it by filtration. The paper ended with the following sentence: "These views are submitted to the association not as sustained by the testimony brought forward, but as having so much support from observed facts as to merit consideration and to call for a close and continued study of the modes of entry of malaria into the system, to the end that, if sustained, the remedy, which involves only an outlay of money, may be applied."

Since then, and without the publication of much new or striking evidence, the theory of the ingestion of malaria in the drinking water has been extensively accepted. Valuable testimony was reported from India in 1884. Large districts at the base of the Himalayas, which were regarded as uninhabitable on account of the deadly fevers that prevailed in them, were successfully settled by constructing masonry wells forty feet deep. The change from insalubrity to health was sharply marked and coincident with the abandonment of the use of surface waters. These reports were but slightly noticed in the English medical journals, as the British practitioner at home has little interest in remittent

fevers; and our own journals also failed to bring them into prominence.

Our army medical officers, for some years back, have been urging earnestly the supply of our military posts with water free from possibilities of typhoid fever. The success of their efforts in this direction has been marked by a gradual lessening of the malarial rate of sickness in the army as a whole. Much of the reduction must be attributed to improvements in drainage, in the construction of barracks, and in the abandonment of insalubrious posts. Some medical officers, however, discovered a marked diminution of their local malarial rate subsequent to the introduction of the new and purer water supply. Dr. M. K. Taylor, for instance, reported this from Fort Sill, Okla: It is difficult, however, to determine from the sick rates of a post what is its actual malarial rate, for the troops are frequently out on field service, where they meet with exposures that place many of them on sick report on their return, and their malarial diseases are credited to the post, although it may be situated in a dry and perfectly healthful location. Statistics vitiated in this way have thrown a veil of doubt on the results that have been claimed, because the claim necessarily rests on the statement of the medical officer that few or none of the malarial cases originated at his post.

However, the post surgeon at Fort Brown, Texas, presented during the past year a report that is free from ambiguity. This post, opposite Matamoras, on the Rio Grande, has heretofore been regarded as a notoriously unhealthy station, owing to the prevalence of malarial fevers. In his annual report for the fiscal year 1889 the surgeon-general of the army says [page 27]:

“At Fort Brown, which must be set down as the most unhealthy post in the country, 286 cases of malarial disease, or nearly two attacks yearly to each man of the 144 constituting the garrison, added 1986.11 to the admission rate per thousand of strength and 26.72 to the non-effective rate. These fevers alone gave this post a much higher rate of admission than was given to the army by all diseases and injuries. Thirty-two venereal cases also figured largely in increasing the rates, particularly that of non-effectiveness, to which they added 20.61. The insanitary site of this post, its rotten and worthless buildings, and the proximity of the towns of Brownsville and Matamoras, sufficiently account for the sick record which it presents.”

On page 32 of the same report the Medical Director explains what he considers to be the cause of the sickness :

“ During the month of November, 1888, 58 per cent. of the command at Fort Brown was taken on sick report for intermittent fever alone. This does not fully represent the ill health of the command. On an inspection of the post, February 24, 1889, when the number of admissions had fallen much below that of November, I found members of nearly all the officers' families suffering with some form of malarial troubles. I was informed that many of the men, when suffering from chills, preferred continuing on duty to reporting sick. The washed-out appearance of nearly every soldier in the command plainly showed the unhealthful surroundings. This post is closely hemmed in on the north by a large town (5000 or 6000) which is practically undrained and filthy beyond description ; on the east by a marsh, and south by a lagoon, which for eight months of the year is cut off from the river. Into this marsh and lagoon all the sewage of the post drains. The lagoon is within thirty feet of the officers' quarters, and the marsh crowds up on occupied buildings on the other side. There must be taken into account the probability of the command being hemmed in by a yellow fever quarantine. It will be a mild epidemic that does not decimate it in its present condition. If this unwholesome spot must be occupied I can only recommend that the garrison be reduced to the minimum and entirely changed every year.”

In the report for the year 1890 Fort Brown is again shown to have the worst record of any post in the army, and on page 37 it is stated that :

“ If Fort Brown, Texas, were expunged from the list of military stations, the prevalence of malarial disease in our army would be greatly reduced. That post had an admission rate of 1676 per thousand of strength and 38.58 of non-effectiveness.”

This is certainly enough to define the reputation of this most undesirable station.

However, in the report for the following year, 1891, a change is observed to have occurred, but no explanation is given. Speaking of malarial fevers, page 30, it is said that :

“ The record of Fort Brown, Texas, was much improved during the year. Instead of 1876 admissions per thousand of strength it had only 325.91, and instead of 38.58 of non-effectiveness it had only 8.32. This alone does much to account for the lowering

of the malarial rate of the army. Seven posts had relatively more admissions and non-effectives than Fort Brown."

During the past year a rapid improvement in the health of the post was observed. The admission rate for malarial disease was only 16.13 per thousand of strength, and its non-effective rate 0.35, the average malarial admission rate of the army having been 62.23, so that this post, which had for so long the unenviable repute of being the most unhealthy of the army, has changed position on the list, and this notwithstanding the continuance of all its unsanitary surroundings, the undrained and filthy town on the north, the marsh crowding up on the east and the lagoon cut off from the river for eight months of the year almost at the doors of the officers' quarters on the south.

In view, however, of the knowledge already gathered concerning malarious waters, we have to seek long for the cause of the change at Fort Brown. During the years of insalubrity the garrison drank the muddy and impure water of the Rio Grande, and during the past and part of the previous year they drank a non-malarious water. In 1890 an ice machine was sent to the post to supply the fevered sick in hospital with ice for cooling draughts. It answered its intended purpose efficiently, but incidentally it did much more. It prevented the very fevers which it had been sent merely to alleviate. A condensing coil was attached to the machine, which was thus enabled to supply the garrison with cool distilled water, and as this was so much superior to the former supply it was immediately used by all for drinking and cooking.

This appears to me to establish the doctrine of malarious waters by testimony not drawn from meagre reports in general terms of what has been effected by the use of deep well water in far-away India, but by the full and accurate records of the medical department of a military post which is even nearer to this city of Mexico than to the city of Washington, to which its reports are rendered.

Commenting on the lessened malarial rates of Fort Brown and other Texas posts that are supplied with ice machines, Surgeon General Sutherland has recommended their issue to other posts that have a water supply of doubtful quality.

Distilled water for potable or culinary use is free from all danger in times of epidemic, whether of typhoid, cholera or yellow fever. Every circular issued recently by boards of health,

national, State or local, in anticipation of cholera, has referred to the danger in the water supply, and has directed the boiling of the water to eliminate that danger. Water from a condensing coil is just such water as has been so generally recommended. It is free also from the danger of propagating the malarial fevers that are endemic in so many parts of the American continent.

In ordinary times the boiling or distillation of water is too costly for the general supply of large communities. Typhoid and malarial fevers are those which should be excluded. Every water that is tainted with sewage has typhoid possibilities, and as has been shown by the Standing Committee of this association on Pollution of Water Supplies the only method of avoiding these possibilities is to obtain a water free from sewage contamination and to preserve it in that condition. Surface waters that from the character of their water-shed are free from danger of typhoid, may nevertheless be credited with malarial possibilities; and if the albuminoid ammonia distilled from them in laboratory experiments be large the possibility becomes a probability. Fort Brown was accounted a most insalubrious station owing to the malarious exhalations from its marshes and lagoons, yet it seems that so far as regards sickness from such exhalations it was no more insalubrious than any of our sea coast health resorts. The so-called endemic fevers of this great continent are the same fevers that until now have been called endemic at Fort Brown. Intermittents in the spring and the remittents in the autumn undermine the health and destroy the energies of numberless communities, and their sites have been and are regarded as insalubrious, without remedy until several generations of sufferers shall have reclaimed the marshes and overflowed lands. This may be the case in many instances, yet the question arises, how many others are insalubrious only as Fort Brown was insalubrious? How many of our people might have been saved like the garrison of that post from the ravages of severe autumnal epidemics by ceasing to take into their systems the prime cause of the disease in every glass of water which they drink!

During the prevalence of these fevers in scattered settlements depending on cistern water, the plan of boiling the water before use is judicious, particularly when, as is usually the case at such times, the water is low and the sediment thick and foul. For larger communities dependent on a general supply from surface collections, ponds, lakes, dams or flowing streams, some other

means of public protection must be adopted. If the water is obtained from a large and generally turbid stream, every effort should be made to provide a purer supply, because typhoid as well as malarial fevers may be propagated. If the water is derived from sources that are free from sewage, the elimination of the malarial poison only has to be considered.

The methods in use of purifying surface water are sedimentation and filtration. Sedimenting basins are in general use in the United States, but we have no information concerning the influence of this process on malaria in water. Perhaps, were the sedimentation prolonged sufficiently, the impurity, including the malarial cause, might be precipitated; but we do not know this. We do not know, however, that sedimentation as generally effected is not sufficient to render a malarious water harmless. The water of the Rio Grande was pumped into sedimenting tanks for the supply of Fort Brown during the whole period covered by its record of insalubrity.

On the other hand, we are fully aware that the changes which take place in a water during its filtration by natural means are all sufficient to deprive it of a malarial taint. No malarial disease has ever been attributed to deep well water; and the substitution of such a water for surface supplies has always lessened the malarial rates of the people thus supplied. Whether filtration as artificially effected, either by filter beds in connection with sedimenting basins as used in England, or by the filtering plants that have been established by many in the United States, be effectual in removing malaria, remains to be ascertained by a study of the health records of these towns before and after the use of the filtered water.

At all events, artificial filtration offers the best known means, outside of distillation, for rendering a surface water non-malarious, and of relieving localities hitherto regarded as insalubrious from their evil repute in this respect.

A Strange Epidemic in Asia.

Advices received from the province of Astrakhan, in South-western Russia, adjoining the Caspian Sea, are to the effect that a strange epidemic, of a character yet unrecognized, is killing thousands of people in the trans-Caspian region. It was partly by this route that cholera entered Russia last year.

Prevention of Cholera and Tuberculosis.¹

BY DANIEL R. BROWER, M.D.,

Of Chicago, Ill.

Professor of Diseases of the Nervous System and Clinical Medicine in the Woman's Medical College; Professor of Mental Diseases, Materia Medica and Therapeutics, Rush Medical College; Attending Neurologist, Cook County Hospital.



Mr. President and Fellows of the State Medical Society:

OUR committee has assigned to me the address on etiology, State medicine and medical jurisprudence, and from the vast field covered by these three important topics, I have selected from the domain of State medicine some few suggestions as to the prevention of two of the most important infectious diseases, viz: Cholera and tuberculosis.

PREVENTION OF DISEASE.

There is no function of the physician more creditable to him than that which he exercises in the prevention of disease. In no other profession, or in no other occupation which men follow, will you find them engaged in preventing the necessity for the exercise of their own special functions. Who ever heard of a lawyer engaged in so simplifying the laws that there would be but little necessity for jurisprudence? Who ever heard of a merchant so instructing his patrons that they would have the least possible necessity for purchasing the various wares and commodities that he has for sale? In this matter the medical profession stands by itself as the most self-sacrificing occupation followed by men.

CHOLERA.

We first ask your attention to that infectious disease which just now is claiming the attention of the profession and so many of the laity throughout the whole civilized world. We find in every medical journal almost in this country and on the Continent of Europe, in the islands of the sea, and in the leading journals of the laity, suggestions for the prevention of cholera. And

to-day we have readily accessible, largely through the results of the marvelous researches of Koch, the means by which this disease can be controlled to an extent that in previous epidemics was not possible. He has taught us that it is due to a specific germ, and the natural history of that germ he and others have studied. We know what promotes its growth, and we know what destroys it. Through these researches we know that cholera is not contagious, that it is not directly communicable from one person to another through the atmosphere; indeed, that it can develop only by the germ passing into the chylipoietic viscera and there finding conditions favorable to its development. We know that it cannot thrive in an acid medium, and if there is a normal quantity of the normal acids present in the stomach the germ is there destroyed; that it must pass into the intestines, the reaction of which must be alkaline in order that its development may take place. We know that its period of incubation when thus introduced is short; four or five days is usually time enough for its full development, and we know that unless the conditions are favorable for the development of the germ, unless the soil has been well prepared, that its growth is not possible. Just as much is this the case as with other vegetable germs, and we can no more expect a harvest of comma bacilli in unfavorable soil than we can expect a crop of wheat from grain sown in the streets of our city. The probability is that during every cholera epidemic very many germs enter the alimentary canal of healthy people, and are digested just as other vegetable products are. We know that an irritable condition of the gastro-intestinal canal favors the growth of the germ. We know that physical and moral depression favors the development of the germ by interfering with the healthful action of the gastro-intestinal mucous membrane. The cholera germs are found only in the dejections and in the vomits, and the cholera germs thus voided by mouth and rectum, neglected, contaminate the soil and the water supply of the population. They attach themselves to the hands of those round about the patient; hide themselves, it may be, under the finger-nails of such attendants, and are readily carried by the hands of the attendant and by the water supply into their gastro-intestinal tract, and then if the conditions for development are favorable, the characteristic symptoms of the disease soon become manifest.

The very first consideration, therefore, in the prevention of the spread of cholera is the thorough disinfection of these dis-

charges, and we have at our ready command to-day many disinfectants that entirely destroy the comma bacillus. Heat—and not a very high temperature at that—is sufficient for this purpose. If these discharges are maintained at a temperature of boiling water for half an hour the germs are effectually destroyed. Carbolic acid, one part in twenty; bichloride of mercury, 1.4000; freshly prepared milk of lime; and the chloride of lime are all equally efficient in the destruction of these germs. These discharges should be caught in vessels, and disinfected before they are removed. The discharges should remain in contact with some one of these disinfectant materials for at least one hour before pouring them away. If the floor has been soiled by them, the soiled place should be immediately disinfected. The air of the sick-room need not be disinfected. Fumigations with sulphur are totally useless. In the furtherance of this work of prevention, it is our duty to make careful inspection of the house in which the case of cholera occurs; the condition of its sewerage, the catch basins and the traps; the condition of the cellar of the house and of the yard all demand our attention. Not only should this be done in the houses where the cholera happens to be, but in all the houses of our patrons. Defective sewerage, unclean catch-basins, defective traps, dirty and damp cellars, uncleanly yards, all furnish habitats in which the cholera germ will thrive. The principal vehicle, however, for the spread of cholera infection is the water. Germs that escape from the patient in the ways suggested passing into the source of water supply there thrive with great rapidity. It is our duty, therefore, to see to it that the water consumed by our patients is not only filtered but boiled, and the boiling should be done recently. There is no filter, I have reason to suppose on the market, that is proof against the cholera germ. The best of these filters to-day in ordinary use is probably the Pasteur filter, but I have reason to believe that the comma bacillus can pass through the pores of this filter. We should instruct our patients to drink no water except such as comes from sources that are absolutely free from the possibility of germs, or else such as has been boiled within twenty-four hours. We should urge a thorough cleansing of the hands before eating, and should see to it that those domestics who are engaged in the preparation of our food take the same precautions against the propagation of the disease. In the next place, inasmuch as an irritable condition of the intestinal canal forms a soil in which the germ thrives, our

patients should be given special instruction in the matter of diet. It should be simple, nourishing, ample, and well cooked. Everything of doubtful propriety should be avoided, such as canned goods of all kinds, preserved meats, raw vegetables and fruits, pastry, cheese and nuts. Special attention should be paid to the milk. There is no fluid in which cholera germs thrive better than in milk, consequently all the milk consumed should be boiled immediately before being used. Particular attention should be paid to the cooking utensils. Scrupulous cleanliness is necessary here ; and the table, furniture, knives and forks and plates, etc., should all be in a state of absolute cleanliness. We should impress upon our patients the very important fact that cholera germs that have been properly cooked are just as harmless as any other vegetable. They should be instructed to avoid excesses of all kinds ; to live lives of great regularity ; avoid over-fatigue ; careful in the use of stimulants ; moderate in exercise ; keep themselves occupied and their minds as free from fear and apprehension as possible ; hold firmly to their ordinary, regular mode of life ; a tranquil life is a strong barrier against the invasion of the disease. Above all things, advise them against leaving their homes in order to escape the disease. Have them consider the much greater danger they are in in traveling and in living in the altered conditions of a strange place than they are when leading a careful and well-regulated life at home.

If a case of cholera should occur among our patients it should be isolated. If the isolation can be made in their own home, there it should be done ; but if it is not possible, by reason of circumstances, to secure this isolation, then they should be taken from their dwelling place to some hospital provided for the purpose. Then every effort should be made to avoid panic. Those who must be in attendance must be told that there is no danger of cholera attacking them unless the germs enter their bodies by their mouths ; that cleanliness of hands and of person, and the proper destruction of the germs by the processes already stated, will make this entrance impossible. We should give to our patients instructions as to what to do before the doctor arrives. On the first appearance of diarrhea they should go to bed at once ; they should be kept warm ; artificial heat applied to the extremities and to the abdomen. There should be administered as speedily as possible either a moderate dose of castor oil in hot milk, or a moderate dose of calomel. They should be instructed

to sip water slightly acidulated with sulphuric acid. If the looseness of the bowels continues, they should be instructed to inject at least a quart of hot water, containing about thirty grains of tannin and thirty drops of laudanum ; and whatever is discharged from the patients by stool or vomit should at once be destroyed, either by heat or by some one of the disinfectants already enumerated.

I do not anticipate that there will be any special difficulty in limiting the spread of cholera in this city should we be so unfortunate as to have it reach here during the coming summer.

A careful examination of the health reports of Chicago from 1851 up to the present time—1851 being the first time these reports were kept—shows the vast improvement that has been made in limiting the spread of the disease. These cholera records in the city of Chicago show that cholera prevailed in 1851 ; it continued with increased violence in 1852, modified somewhat in violence in 1853, occurring again with very much renewed activity in 1854, and again in 1855. For five years the disease prevailed here to a very considerable extent in proportion to the population of those days, causing 2418 deaths ; but when cholera returned here in 1866, that year of its invasion there were 990 deaths, but the next year only ten deaths, and then the epidemic disappeared. In 1873 there were only twenty-three deaths, and no recurring cases the following year. The total number of deaths in Chicago from the beginning of the records of the health department to the present time is 3446.

THE PREVENTION OF TUBERCULOSIS.

Important as is the prevention of cholera, there is another infectious disease probably as easily preventable with us, and is producing vastly greater destruction of human life. Since the records of the health department of Chicago have been kept—that is, since 1851—there have been 39,309 deaths from tuberculosis in this city, more than ten times as many as from cholera. The annual mortality here for the last two years has been close on 2500 people. And this disease, from this standpoint of observation, demands, on the part of the profession and the laity, in my humble judgment, the same, and indeed more, earnest efforts for its prevention than have been and are being bestowed upon the other infectious disease.

It is a marvelous thing that the same great pathologist, Koch,

has demonstrated for us also the germ of this disease, and the bacillus tuberculosis is as much a contribution of Koch to pathology as is the comma bacillus. We should have, in my judgment, the same organized and systematic efforts for the suppression of this disease as we have for cholera; and I think it is the duty of this medical society, and every other medical society, to teach the laity the infectiousness of tuberculosis, and to give them the same plain and simple directions for the destruction of the bacillus of tuberculosis as have been given so often for the destruction of the germ of cholera. I think there should be, especially in this country, just as there has been on the Continent of Europe, anti-tuberculosis leagues, the object of which shall be to instruct the people, not only as to the infectiousness of these germs, but also as to the means by which they may be destroyed. The bacilli of tuberculosis spread broadcast when the sputum of tuberculous patients is expectorated on the ground or on the floors of our street cars, hotels or other crowded and frequented places, for no amount of drying will destroy the activity of this germ. It is also scattered by the consumption of milk from tuberculous cows. This germ, like many others, develops with marvelous rapidity in milk, and not only is the disease communicated by the ingestion of such milk, but by the ingestion of the products of such milk—butter and cheese. Then the meat of tuberculous animals, that has not been properly cooked, is probably also a very important means for the propagation of the disease.

As a means, then, of prophylaxis, efforts should be made to prevent the inhaling of dried and pulverized sputum. This may occur when the ordinary handkerchief is used by a tubercular person. With such handkerchiefs often the dried expectoration may be diffused through the air, and may be inhaled by other people as well as by the patients themselves, and thereby not only communicate the disease to others, but may also result in the spread of the disease in the patient himself by causing the infection of previously healthy portions of the lungs. The sputum also should never be discharged on the ground, or on the floors of public places. The habit then of spitting is not only offensive, but dangerous. Public places occupied by tubercular individuals should be liberally supplied with spit cups, or cuspidors, and in these should be placed disinfectants, and the contents of them should never be emptied into the sewers until the vitality of the bacillus has been destroyed either by boiling or by the use of

some one of the disinfectants. The expectoration, if not discharged in spit cups or in flasks, should be discharged into pieces of linen or calico, that should be burned as soon as possible after having been used. The destruction of the sputum is the very foundation of the limiting of the disease, and all nurses and the laity generally should be instructed as to the necessity of this destruction.

We should take care to prevent the introduction into our families of tubercular nurses, governesses, and teachers in boarding schools, and in children's homes. Attention should be called to the danger of cigars that come from tubercular cigar makers. The germs of tuberculosis are also found in the dejections of the tubercular patients, and these should be rendered harmless by proper disinfection, and the linen stained by the dejection should not be dried, but boiled or burnt. All rooms that have been occupied by tubercular patients should be thoroughly disinfected before they are occupied by other patients. The carpets, curtains, bed coverings should be subjected to a high degree of heat, and the floors and the walls should be thoroughly disinfected, and using no spoons, cups, and other articles which have not been properly washed after being used by tubercular patients. Kissing is also a possible source of infection, and should be especially guarded against in the case of children. Then the milk used in general consumption should be subjected to a temperature high enough to destroy these possible germs before it is consumed. The meat that is placed on consumption should undergo inspection, in order that the use of tuberculous meat may be avoided.

May we not express the hope that if there is a proper effort on the part of the profession to instruct the laity in these dangers and in these remedies that tuberculosis, now the principal cause of disease in this great city, and as a cause of disease increasing rather faster than the population, may be minimized even to a greater extent than has been done in the case of the other infectious disease with which we began this address.

The Relations of the Official Weather Services to Sanitary Science.¹

BY MARK W. HARRINGTON,
Chief of Weather Bureau, Washington, D. C.



INCE man is immersed in the ærial ocean which forms the subject of study on the part of the meteorologist and climatologist, it might reasonably be expected that the results obtained by the labors of these would prove of the highest value to physicians and other students of sanitary science.

This expectation is rendered all the more reasonable by the fact that the work of the meteorologist has proved of the greatest value to commerce and agriculture. It is, perhaps, not too much to say that this reasonable expectation on the part of sanitary students has not been fully realized, and as a first step toward improving the relations of these two important branches of science, it is proper to inquire what are the reasons of this failure.

First, it may be desirable to point out in what directions meteorological data would be likely to be of use to physicians and others interested in physical man. The bearing of weather predictions on sanitary science may be dropped without discussion, not because it is not important, but because it is now well established in many countries, its lines are well laid out for countries where it is still to be established, and its service to sanitary science is like that to all other forms of human activity, that is, the forecasts are presented to sanitarians as to all others, and they can select from them such as are useful, and can do this without advice from meteorologists.

Aside from forecasts, meteorological work appears to be of importance to physicians in three different ways:

(1) In the reduction of their observations to systematic climatology, thus giving the broad features of the climate of the different parts of the earth. With this can be studied the relations of man to climate in a general sense, such as the relations of climate to race, to the different forms of industry, and to general diseases.

¹ Paper read before the American Public Health Association at the Mexico meeting.

(2) In giving the climate of health resorts, the data of general climatology are not sufficiently detailed for this. The ordinary meteorological observations need to be reduced and combined on a special plan (and one not always followed by meteorologists), before they can give the information which a physician needs in order to decide whether or not he may send his patient to a given health resort. Moreover, the physician needs some data, which are not, by meteorologists at least, considered properly and purely meteorological. These will be referred to later.

(3) In giving the data of weather to enable the physician to correlate any special pathological phenomenon, as the fluctuations of a disease, or the appearance of an epidemic (as, say, yellow fever), with the elements of weather which preceded or accompanied.

Now, all these things require that the data of the weather and climate be on tap, so to speak, for the benefit of sanitarians and physicians; but this is already done. In each of the categories above mentioned the data already exist in an amazing, in fact fairly appalling, fulness. The U. S. Weather Map extends now in an unbroken bi-daily or tri-daily series for over a score of years, and it has been so broadly scattered that it can be consulted in almost any country, and the same is, *mutatis mutandis*, true of a dozen other weather services. The world has been so completely covered with stations that fairly exact climatological maps now include its entire surface. If there is any lack it is in the case of health resorts, but for many of these the ordinary meteorological data exist in abundant fulness. And yet, to judge by my correspondence and verbal statements, the physicians and other sanitarians do not feel that their wants are yet fully met.

There must be reasons for this, and they are not far to seek. The following may be mentioned as principal ones, though there are doubtless others:

(1) The data desired by sanitarians and physicians may not be furnished them in a form suitable for their use. For instance, among the temperature data, for health resorts especially, the physicians particularly desire the variability. Two places may have the same mean temperature, say 45° F., but may be as far apart as the poles in their availability for invalids. One may have an occasional change of 40° F. in a few hours, while the other may not have an absolute annual range of that amount.

Meteorologists already compute and record variability of temperature and other elements, but apparently their method of doing this is not suitable for the physician. Again, the pressure given by meteorologists is that reduced to sea level, while that desired by the physician is the actual or unreduced. The humidities usually given in meteorological tables are the means of relative humidities, which are not only uninformative as means, but are also uninformative to the physician as a meteorological element, as they are compound, depending on both temperature and the vapor contents of the air. The moisture really appears to be of high sanitary importance. It is certainly of great weight in causing subjective feelings of comfort and discomfort, but it is comparatively neglected in climatological studies. Other cases of lack of availability of climatic data for the use of physicians could be pointed out, but it is sufficient to have indicated their general character.

This lack, from the standpoint of the physician and sanitarian, can be remedied. It is simply a question of handling observations already taken. An absolutely necessary preliminary is that the proposed beneficiaries should indicate clearly just what they want and in what form they want it. Such a movement could, with great propriety, be initiated in such an association as this, and the purpose of this paper will be fully attained if it can prevail on the physicians and sanitarians here assembled to formulate their needs, so far as concerns data already collected by governmental meteorological service.

(2) There are, however, certain things of great importance in matters of health and disease of which the modern meteorologist takes little or no account, and these are much more important to sanitarians than the data just mentioned. I refer to sunshine, to the purity or impurity of the air, to the condition of the soil and the disposal of rainfall and to the active oxidizing agents in the air familiarly classified together as "ozone." These are the atmospheric things that sanitarians are especially interested in, but with the exception of sunshine these do not form any part of the field of the meteorologist, as usually defined.

Automatic sunshine records are now carried on at very many stations, and to some extent published. The work of the stations in this direction will grow, and with the lapse of years the results will be, so to speak, codified and rendered generally available.

As to the purity of the air, disposal of waters, state of the

soil, and ozone, the meteorologists will generally enter a plea of *non possumus*, at least so far as regards regular official weather stations. In the case of ozone the observations can easily be taken, but they are so lacking in scientific discrimination and in accuracy of measurement that a responsible head of a great weather service would prefer, before loading his hard-worked and under-paid observers with additional duties, to wait until the methods had become so perfected that he might know what it was that was being measured.

In the case of ozone the meteorological plea is, properly speaking, *non volumus*, while in the others *non possumus* is the proper plea. The purity of the air depends on the presence or absence of foreign gases or of dust. The former requires chemical analysis, and cannot be performed by any of the simple and speedy methods of a meteorological observing station. As to the dust, there are fairly speedy methods of approximate counting of the particles, but this does not reach the requirements of sanitary science. Of two particles exactly alike to the counter, one may be inert while the other may have within it the potentiality of an epidemic of cholera. To differentiate these a laboratory, plenty of time, and the skill of the trained hygienist are necessary. Much the same is true for the data relating to the condition of the soil and the disposal of the rainfall after it has reached the earth. These are all matters for special treatment in laboratories where the methods are in only small part meteorological.

In conclusion, attention should be called to the comparative neglect of meteorology (which in its broadest sense includes climatology) in the schools, more especially in the medical schools.

Education in this line is as yet, for the most part, confined to the limited range of climatic ideas to be found in the physical geographies, and while some sanitarians are well informed about climate, and a few are professional students of the subject, it is generally true that even such fundamental lines as normal, relative humidity, and cyclone, are not understood and appreciated. It may be said that this is due to the lack of good pedagogic literature on the subject, but the difficulty lies further back than that. The literature will be furnished when there is a demand for it. The difficulty lies in the lack of education on the subject. Meteorology is as much entitled to a place in a course of study as any other science, and it should be one of the fundamental sciences for the medical student.

SUGGESTIONS FOR METEOROLOGICAL DATA IN FORM TO BE
AVAILABLE FOR SANITARIANS.

Atmospheric Pressure.—This is an important element for hygienic use. The variations of pressure at sea level are generally not greater than a tourist would undergo in being carried to the top of the Washington Monument, and seldom greater than would be undergone on being carried to the top of the Eiffel Tower. The corresponding natural changes would take several days or weeks, while the changes of elevation mentioned take only fractions of an hour. Apparently the only barometric element of use to the sanitarian is :

I. *The average of the actual pressure* (that is, pressures unreduced for altitudes).

Atmospheric Temperature.—For hygienic purposes the details of temperature are of interest, as on a sunny day the temperature may differ greatly in short distances, depending on the exposure and the character of the surroundings. The meteorologist has defined the air temperature as that of free air at about the height of a man, the thermometer being protected from all radiation. With such a definition the temperature data which could be prepared from observations now taken, and which might be of use to sanitarians, would appear to be as follows :

II. *The mean temperatures* of the hours, months, seasons and year.

III. *The mean maxima and minima* for the months, seasons, and year.

IV. *The absolute maxima and minima* for the same.

V. *The mean and absolute amplitudes* for the same.

VI. *Interdiurnal variability* (*i. e.*, the mean change in mean daily temperatures).

VII. *List of sharp changes* of temperature of short duration.

VIII. *Frequency of freezing days* (mean temperature less than 32° F.); of *frost days* (minimum temperature below 32° F.); of *hot days* (maximum temperature 86° F.), and of *very hot days* (maximum temperature 95° F.).

IX. *Mean and absolute dates of the last and first frosts.*

X. *Mean and absolute duration of freezing, of hot, and of very hot weather.*

XI. *Means of temperature of evaporation* (*i. e.*, of the wet-bulb thermometer).

This is an element which has not been discussed, so far as

known to the writer, though Lieutenant Glassford suggested it to him some time ago. Its significance lies in the fact that it would approximately represent the temperature of the person in hot weather. It would help to distinguish between the distressing moist heat of some stations and the more endurable dry heat of others. It should probably be given in means, and associated with the corresponding air temperature (or temperature by the dry-bulb thermometer). It could be given thus:

Air temperature.	Mean.	Temperature of evaporation.
70° to 80°	75°	
80° to 90°	85°	
90° to 100°	95°	
100° or more.	. .	

A similar table for low temperatures might be of use, as it is thought that dry, cold weather is less hard to endure than wet, cold weather.

Aqueous Vapor in the Air.—With the dew point and the actual temperature known, it is easy to take from tables the relative or absolute humidity, and also the deficiency of vapor which has been recommended by Buys-Ballot, Wild, and others, as of considerable hygienic importance. The same data can be taken from the mean values of temperature and dew point. Hence it may be well to include in data of hygienic interest:

XII. The mean dew-point temperatures for the months, seasons, and year. The resulting humidities would be somewhat artificial, and many would prefer the means of the actual values, giving—

XIII. The means and extremes of the absolute humidity (pressure of vapor).

XIV. The means and extremes of deficiency of aqueous vapor (*i. e.*, the amount needed to bring the absolute humidities to saturation).

XV. The frequency of the values of relative humidity by months and year. (The mean value of the relative humidity can probably best be obtained from the mean dew point.

Cloudiness and Sunshine.—The ordinary means of observations of cloudiness are confessedly unsatisfactory, and would not be very significant of the distribution of sunny or cloudy weather. A better datum for hygienic purposes would, undoubtedly, be the following:

XVI. Mean number of cloudy days (0.2 or less of clouds), fair days (0.2 to 0.8 cloudy), and clear days (0.8 or more of clouds).

XVII. Mean and maximum number of consecutive clear and cloudy days for each month.

The percentages of cloudiness could be profitably replaced by those of sunshine, and the latter would be most useful in the form of probability of sunshine, that is, the ratio of hours of sunshine to the total number of hours, or—

XVIII. Probability of sunshine for each hour.

XIX. The same for each month, season, and for the year.

Rain and Snow.—XX. Amount of precipitation by months, season and year.

XXI. Equalized monthly percentages of precipitation by months, seasons, and year.

XXII. Probability of days with no rain (0.01 inch or less), and of days of heavy rains (one inch or more), by months, seasons, and year.

XXIII. Cases of torrential rains.

XXIV. Frequency of hail.

XXV. Frequency of fog.

XXVI. Frequency of thunderstorms.

XXVII. Average and extreme first and last days of snow.

XXVIII. Average and extreme duration of unbroken snow covering.

Winds.—XXIX. Frequency from each direction and of calms by hours, months, seasons, and year.

XXX. Mean velocities by hours, month, seasons, and year.

XXXI. Frequency of high winds, *i. e.*, of winds of from thirty to forty miles, forty to fifty miles, fifty miles and over, per hour.

XXXII. Statistics of hot or cold winds, and duration of continuous wind from a single direction.

XXXIII. Wind-roses for temperature, humidity, and precipitation.

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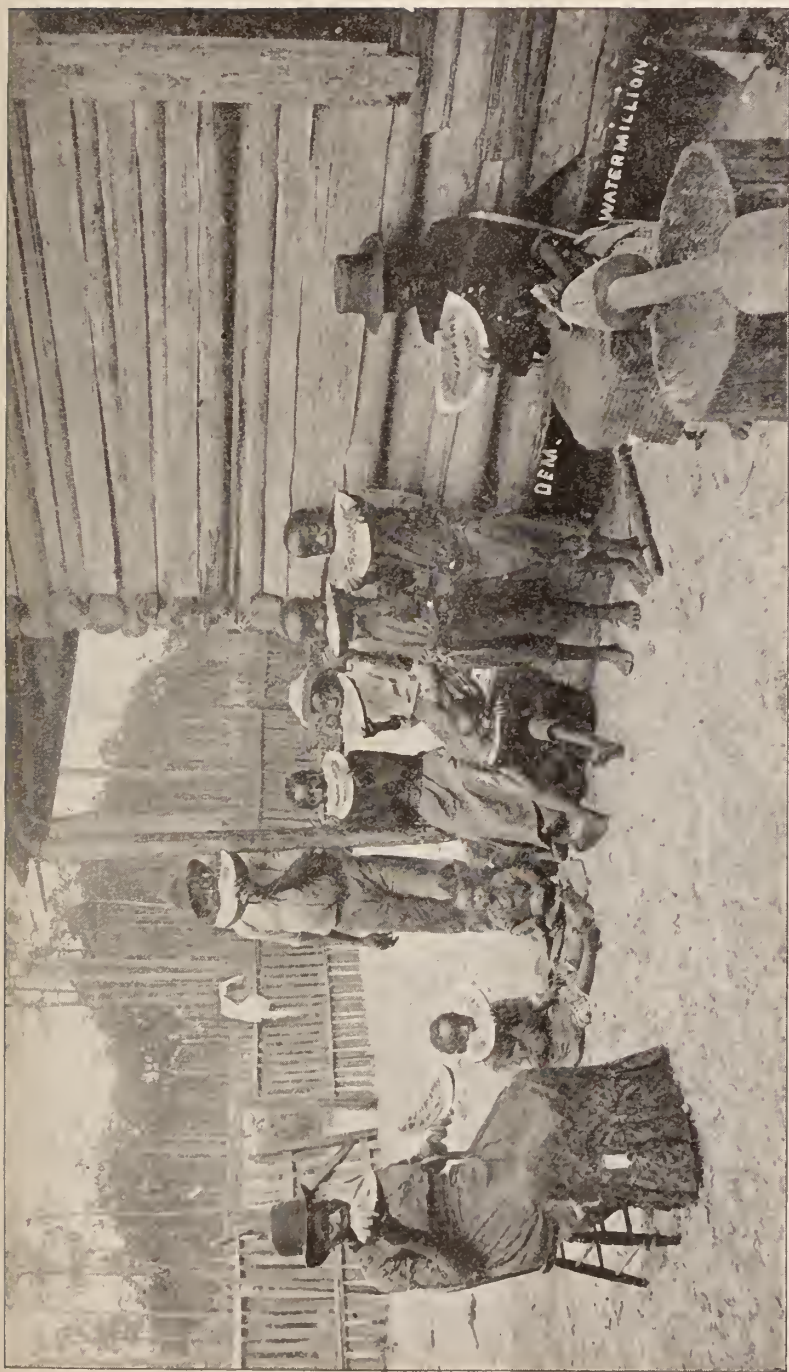
Contentment.

TO the thoughtless individual it would seem idle to argue that man should be otherwise than nature has made him. Humiliating to the intelligence of humanity as such an acceptance would be, yet it is just the position that is held by the great, the very great, majority of human beings. The plant that is cared for by the intellect of man differs widely, in many respects, from that which is left, unaided, to the care of nature. The dog and cat of civilization differ widely from the tiger and wolf of nature; the truly civilized man is a very different being from the wild child of nature, untutored and unmoulded by the influences of civilization.

We are ardent friends of nature, and we always earnestly wish that humanity could be much more in accord therewith than it is; but we are also practical, and since we see humanity very far removed from a state of nature by the evolutionary influences of so-called civilization, since we see the aspect of humanity greatly modified by the almost imperceptibly working influences of its surroundings, we are forced to the conclusion that we are not wholly as nature makes us, but rather is our natural condition fitted into the mould of surrounding circumstances.

Such being the case, our natures being subject to the moulding influences of our exterior associations, is it not equally true that our natures are also subject to the modifying influences that originate within, from the intelligence with which nature has endowed us?

The casual observer will doubtless deny this proposition; he



CONTENTMENT.

is not sensible of the extremely gradual influence of external surroundings, and, guided in all of his actions by impulse, he is not ready to accept the doctrine that his intellect can have any control over what he is pleased to call his disposition or his temperament.

In plain English, self-control or reflective action is possessed by but few, because but few realize that the human being is capable of self-control. As the muscular system is developed by exercise, and as but few are as strong as they could be, because they do not resort to muscular exercise, so the mental power of self-control, because it is not exercised, is very weak in the majority of individuals. We do not realize that the mental, as well as the physical aspect of humanity, is capable of development by use.

It is greatly to the physical detriment of mankind that his ability to develop and control his mental attributes is not more universally appreciated, for there are but few conditions more conducive to mental and physical health than self-control, and all that these two words imply. Is there anything more ardently wished and less often enjoyed than contentment? Is it not almost an impossibility to find among your acquaintances a truly contented man, woman or child? Yet philosophic contentment is possible to any one who will use his intelligence to develop his self-control to the point of thoroughly realizing that discontent will never produce contentment.

We do not mean to decry a laudable ambition to better one's worldly condition, and we would not have our words so construed, but we would ask any reasonable individual whether it ever helps one to better himself to be discontented with that which he has? Contentment and ambition are not incompatible, but, when rightly understood, the one is rather an aid to the other.

These "happy darkies" in our illustration are certainly none the worse for the contentment which a slice of watermelon brings to them, and did we but train our intellects properly we would be able to discover cause for contentment in all that surrounds or that may befall us. There is within each and every one of us the germ of self-control, which, cultivated by our intelligence and by the determination to be masters of ourselves, will vouchsafe to us the spirit of contentment that will do so much to prolong our lives and to give us health and happiness during our earthly existence.

Keep Cool.

NOW that the hot days of summer are upon us, we would strongly urge our readers to “keep cool,” with all that these words imply. We do not mean only that we should strive to keep the sensation of being overly warm away from us, but that we should bank our fires and, so to speak, ceasing to live that we should vegetate, as it were, until the cool weather is with us. “Every dog has his day,” you know, and when the thermometer is up in the nineties is not the time for human begins to labor.

Hot weather is the period of activity for vegetable life, and it should be the time of dormancy for animal existence. In winter vegetation rests, and in summer it labors. Learning the lesson from this fact, man should labor in cold, and recuperate from his labor, in warm weather.

Instinct tends this way, for custom has ordained the summer as the time of rest from labor, but we would argue for an even greater extension of this tendency than at present obtains.

One of the Dangers of Success.

SO long as the ambitious man is striving for worldly success he is apt to lead a frugal life that will tend to conserve his physical health; but the goal once reached, in the very large majority of cases, indolence and high living will take the place of the former frugality, which the struggle for success has made a necessity. That this unfortunate trait of humanity has existed in all ages we find evidence in the book of Jeremiah, who, when lamenting over the sinful condition of the children of Israel, mourns that as they have become great and enriched, so also have they grown gross and fat, and have thereby invited divine punishment. As with the Israelites of old, so with the men of to-day and of all time to come; indolence that is born of success is inimical to health. It is, as we have said, a human trait, and we do not hope to eradicate it, but it may be that there are a few who will heed our word of warning.

If you close the safety-valve of an engine and let it continue to make steam, something must give way, and it is sure to burst; this no one will deny. Equally true is it that if the rich man lives that he may eat and takes not a sufficiency of exercise to work off his surplus of food and drink, something will surely give way with him, and he, also, will prematurely burst. These are homely words, but they are pregnant with wisdom.



Our Medical Guard Abroad.

Dr. R. M. Woodward, passed assistant-surgeon United States Marine Hospital Service, who has been in command of the hospital, Cairo, Ill., for the last three years, has been ordered to Rotterdam, Holland, where he goes on duty under the new immigration law, and with a view to prevent the importation of cholera from that port. He has been relieved from duty by Dr. Blue, and went on duty at Rotterdam April 1. His colleagues are assigned as follows: Dr. Purviance, to Liverpool; Dr. Pettus, Southampton; Dr. Roseman, Antwerp; Dr. Irwin, Marseilles; Dr. Houghton, Havre; Dr. Godfrey, Naples; Dr. Magruder, Genoa; and Dr. White, Hamburg. All of them will remain abroad as quarantine officers for four years.

Vital Statistics of Japan.

During the past twenty years the population of Japan has increased very rapidly; while in 1872 it was 33,110,000, in 1890 it had risen to 40,070,000, and the increase has been well maintained since then. At this rate of progress it is estimated that Japan will in about fifty years have a population of 80,000,000. A native economist, Mr. Ourakami, attributes the rapid increase of population in Japan partly to the growth of national wealth, but chiefly to the low death rate among infants. It appears that next to France Japan has the lowest birth rate of any known country, but this is counterbalanced by the conservation of infant life. In fact, in point of infant mortality, Japan at present stands next to England among the nations of the world. Thus, while in Russia the death rate per 1000 among children under five years of age is 423, in Bavaria 405, in Austria 390, in France 341, in Prussia 335, in Japan it is 276, and in England 255. The proportion of the sexes in Japan is 100 boys to 97 girls. The number of aged people is also somewhat surprising. Thus in 1890 the total number of centenarians was 177, the oldest individual being credited with 107 years. Of nonogenarians there were 11,245. During the year 1890 there were 325,141 marriages and no less than 109,088 divorces.

Venus de Medicis Not a Healthy Type.

Some years ago, at the house of Sir Richard Owen, the great naturalist, Mr. Hunt, met the artist professor of sanitary science, the late Sir Edwin Chadwick, who began a conversation thus: "As a commissioner of health, I must profess myself altogether opposed to the artistic theory of beauty. There is the Venus de Medicis, which you artists regard as giving the perfect type of female form. I should require that a typical statue with such pretensions should bear evidence of perfect power of life, with steady prospect of health, and signs of mental vigor; but she has neither. Her chest is narrow, indicating unrobust lungs; her limbs are without evidence of due training of muscle; her shoulders are not well braced up, and her cranium and her face, too, are deficient in all traits of intellect. She would be a miserable mistress of a house and a contemptible mother."

Cholera this Season.

Preventive medicine and the germ theory are the crowning triumphs of the nineteenth century.

While the germ theory has taught us but little in the way of therapy, it has placed the science of prophylaxis on an eminence never before attained. The ounce of prevention has come to be worth *several pounds of cure*.

In view of the possible, nay probable, epidemic of cholera during the hot season just ahead of us, it behooves us as a people, both in the aggregate and segregate, to preach, practice and enforce all the means of prevention within our knowledge or power. This is a form of charity in which we need not fear to let our right hand know what our left hand does. Let those in large cities whose duty it is to look after the health of the inhabitants see to it that the cities are put in the very best possible condition. In this connection the words clean and sanitary are synonyms. Let the fat alderman "with fair round belly with good capon lined" stop the amber stream of lager long enough to consider for a moment the welfare of the tax-payers whose money he delights to spend.

Let the small towns clean up their yards and outhouses. Let them abolish the stinking pig sty, whose odor exhalet to heaven, whose muddy floor offers a free soil, a good culture medium and

fine homestead law for any wandering cholera spirillum or diphtheritic coccus that chooses to stake off a claim and "prove up" in a quarter section of such inviting territory.

The water supply of both cities and small towns should be looked after with scrupulous care, and where the source of supply is likely to be contaminated, the people should be instructed to boil all that is used for drinking purposes.

With our present knowledge of the comma bacillus, and how to destroy it, we can act with intelligence and effect in our efforts to ward off the coming pestilence. Now is the time to act. Now is the time to get scared. "Let us act in the living present."

There is reason to fear an epidemic from either or both of two sources. The germs of last year may lie dormant till favorable weather appears, when they can get a foothold that can scarcely be eradicated. Again, infection may come along the lines of travel and commerce and easily slip past the scattered cordons of quarantine.

But in order that there may be no mistake made when cholera does appear, or when diseases which simulate it make their presence felt in our midst, all physicians in commercial metropolis, at least, should make themselves familiar with both the natural history and the bacteriology of the disease in order that a panic may not grow out of some simple case of "belly-ache;" and, on the other hand, that no precautions to avoid contagion may be neglected in the presence of the real disease under the impression that only a case of ordinary cholera nostras is to be conquered.

Sternberg has lately shown that sunshine is one of the very best destructive agencies which the comma spirillum can be exposed to. Let us turn on the sunlight. It is both cheap and plentiful.—*Med. and Surg. Reporter.*

Athletic Exercises as a Cause of Disease of the Heart and Aorta.

This was the subject of a paper read by Dr. Collier, of Oxford, before the Medical Society of London. He desired to direct attention to the growing tendency on the part of young Englishmen to indulge in certain athletic exercises to an extent likely to prove harmful. He referred to the connection between oft-repeated muscular effort and diseases of the heart, pointed out by Dr. Peacock as observed in Cornish miners. In these men the symptoms

began to develop about the age of 40, with slight dyspnœa and palpitation, gradually increasing in severity. The pathological changes observed were dilatation and hypertrophy of the ventricles, with, in a certain proportion, incompetence of the aortic valves. He also referred to the researches of Dr. Clifford Allbutt, contained in the St. George's Hospital Reports for 1870, in respect of the same causes operating in the forges, docks and engineering works of Leeds. The lesions developed soon in the badly fed, the aortic lesions being the most pronounced. Dilatation of the aorta increased the work of the heart by rendering necessary the propulsion of a larger quantity of blood, and the distension increased until incompetence resulted. Other observations on the productions of "irritable heart" in soldiers had appeared in the *American Journal of Medical Sciences*, by Dr. Da Costa, of Philadelphia. This condition, under forced marches, frequently renders the men unfit for service. The same sequence of events had often been observed in animals, such as racehorses, greyhounds and foxhounds. The evidence, then, was conclusive as to the effect of frequently-repeated muscular exertion in the production of heart disease.—*Lancet*.

Dandruff Cures.

A correspondent of the *Lancet* asked for advice regarding very persistent dandruff which affected a female patient, and he has received the following response: Dr. David Couper, of Glasgow, advises the patient to wash well the roots of the hair twice daily with a lotion composed of perchloride of mercury in a saturated alcoholic solution of boracic acid (quantity not stated). When this has dried let her rub in an ointment of sulphur and carbolic acid—say twenty grains of the first and one-half drachm of the other to the ounce—using lanoline or lard, or a mixture of both as an excipient. Dr. E. Curtin says he has had good results in obstinate cases of scurf of the scalp by washing the head in warm water containing about three drachms each of sod. bicarb. and liq. picis carb. to the quart, and afterward applying ichthyol ointment. Dr. E. Fenoulhet, of Herne Bay, suggests a weak sulphur ointment. He has used it of the strength of two drachms to the ounce of vaseline in a most obstinate case of dandruff with complete success.—*Ex.*

Consumption and the Aged.

The *New York Medical Record* calls attention to the much greater prevalence of consumption among later adult life than is generally believed to exist. Statistics show that the disease is proportionately much more frequent in the aged than in children. The Register General of England makes the death rate for phthisis between the ages of 55 and 65 greater than between the ages of 15 and 20, and between 65 and 75 twice as great as between 10 and 15. In later life the symptoms of consumption are far less pronounced than at an earlier period of life, and many an old person may be in a far advanced stage of the disease and still be regarded as only an invalid possessing no well-defined disease. In some cases the affection even will imitate diseases of the stomach or of the other abdominal organs. Maclachan and McKenzie have pointed out that hæmoptysis is to be met with in later life, chiefly toward the end of the disease, and that sudden death from this cause often occurs in persons who were never suspected of being tubercular. Owing to the obscurity that enshrouds phthisis in the aged, any protracted and undefined illness, debility and loss of strength in elderly people should be looked upon suspiciously. The aged are necessarily exposed to all those conditions that favor the development of consumption. Their greater sensitiveness at atmospheric changes or extremes, weakened digestive and assimilative powers and tendency to less exercise and to inhabit closer rooms, are all conditions that tend to develop the disease. In localities with springs that linger long between and betwixt winter and spring, with long gray chilly days, with slush under foot—preventing the aged or those of feeble physique or very susceptible constitutions from taking the outer air—consumption among this aged class is almost inevitable. Man should so regulate his affairs through life, in such a manner as to allow him to pass the autumn days of his stay on earth in climates wherein he may in his old age renew the out-of-door life of his boyhood and youth. With the aged it is not a question of altitude or of a desiccated atmosphere; with them it is a simple question of living in such a conditioned atmosphere as will enable them to enjoy the greatest number of out-of-doors hours every day and that will allow the greatest facility for ventilation when indoors or asleep. In such a climate the possibilities of an aged person becoming consumptive are reduced to a minimum.

Prophylaxis of Hereditary Tubercle.

Under the above title an interesting paper is contributed to the *Journal de Médecine de Bordeaux*, by Dr. E. Solles. He describes in detail the various observations he has made on animals. He inoculated guinea pigs and rabbits with matters obtained from scrofulous children, and the conclusions at which he arrives are as follows:

(1) When tubercle is hereditary, local tubercular lesions develop a longer or shorter period after birth. As a rule these lesions increase in intensity and extent with the age of the patient, and they become more firmly established as time goes on. They obtain their maximum of frequency in young adult life. In the first few years of life there seems to exist a period of variable duration, in which the spores of the bacilli, although capable of being stirred into activity, are yet capable of being thrown off, and if this takes place the individual may escape. Dr. Solles elaborately describes it as “la période d’inertie silencieuse de l’ensemencement tuberculeux congénital.”

(2) This period, during which the spores are inactive, lasts a variable length of time, the period apparently depending upon the number of spores which have accumulated within the foetus, and the ease or the reverse with which they are eliminated from the system.

(3) The tubercular material may be got rid of in several ways. The fæces and urine of children, tubercular by heredity, have been proved to be capable of producing tubercle in guinea pigs. The blood, sweat, saliva, and tears, although there is no reason why they should not be infective, have as yet given negative results.

(4) Hereditary tubercle is essentially a “parasitic retention.” Those affected may escape from local lesions or not, the number of such local lesions depending, as before said, on the number of spores, the rate at which they develop, and the deficiency of resistance on the part of the host.

(5) We cannot yet say with certainty whether tuberculosis kills by the actual damage which the organs undergo, and the results of those injuries, or by the toxic action of the ptomaines which are evolved, or by toxic agents not yet determined.

(6) The preventive treatment of hereditary tubercle must follow on the lines of nature; it consists in aiding and hastening as far as possible the expulsion of the tubercular germs from the

organism—in short, to cause the elimination of the spores before they have become encapsuled by fibrous tissue. The treatment is based on two lines, eliminative and restorative.

(7) In the first years of life the physician is obliged to proceed with caution, and to employ only those means which will not be too great a tax on the little patient, and the treatment should be interrupted occasionally, the intervening periods being regulated by the circumstances of the case. This is particularly to be observed with the expulsive treatment up to the age of puberty. The first measures are to ensure that all the secretory organs are acting freely; repeated purgatives, chosen with regard to the age of the patient, should be administered, and the action of the skin assured by active muscular exercise. Dr. Solles thinks that the portal system contains the largest number of spores, and consequently the functions of the liver should be stimulated. Iodide of potassium seems to have a powerful eliminative action. The skin should be further stimulated by hot baths, and also by sulphur baths, and the natural medicinal waters.

A Question of Seed and Soil.

Dr. Andrew H. Smith says there are two factors to be taken into consideration, one being the seed, the other the soil, and in proportion as we made these facts clear to the public, would our advice for preventing the spread of tuberculosis be followed. When asked why so many escaped when the tubercle bacillus was so plentiful, he answered by illustration, saying that rice sown on the top of a sandy hill would never bring forth a crop; or, prepare a river bottom ever so well, and sow no rice, there still would be no crop. It required the proper seed, and also the proper soil, to reap a harvest. Applying this to tuberculosis, to prevent dissemination of the seed was very important, yet of equal importance was it to obviate preparing a suitable soil. Every mode of life, every surrounding which depressed the vitality, made the soil better for the germination of the seed. In the country whole families were often affected, which Dr. Smith attributed to small rooms, want of ventilation, and uncleanness. The town post-office, he thought, needed attention as well as the criminal court room. Might not the germ be carried in the mail?

Diet in Obesity.

Dr. Towers Smith gives the following rules :

FIRST PERIOD, FOURTEEN DAYS.

Breakfast: Tea or coffee, with saccharin, if desired, in lieu of sugar; bread or biscuits made from soya bean, two ounces; grilled white fish or red meat, kidneys.

Lunch: Cut from joint of beef or mutton, taking no fat, and one helping of green vegetables, avoiding only peas, beans and all roots; soya bread or biscuit, one ounce.

DRINK.

First thing on waking: Tumbler of hot water with slice of lemon.

11 A.M.: Cup of bovril or clear soup.

Lunch: Two glasses of claret or one ounce of whiskey with potash water.

5 P.M.: Cup of bovril or clear soup.

Dinner: Two glasses of still hock or claret, or whiskey or potash.

Bedtime: Cup of bovril or clear soup.

Mustard, pepper, salt, or Harvey's sauce, may be taken.

SECOND PERIOD, TWENTY-ONE DAYS.

Additions to No. 1: Oysters, tongue, stewed fruit, with saccharin; poultry, game.

THIRD PERIOD, THIRTY-ONE DAYS.

Additions to No. 2: Toast instead of soya bread, for each meal, two ounces; savory jellies, aspic of prawns, plovers' eggs, jelly.

Dessert: A small quantity of fruit; blue-mould Dorset cheese.
Med. Times.

Plants with Poisonous Odors.

There are few flowers whose perfume is actually deadly. It is said, however, that the flowers of the *kali mujah*, or death plant, found in the islands of Java and Sumatra, emit a perfume so powerful as to overcome, if inhaled for any length of time, a full-grown man, and killing all forms of insect life approaching

it. This perfume resembles chloroform in the effect, producing insensibility. All insects and birds seem instinctively to avoid the plant. Linnæus mentions a case in which the odor of the rose bay proved fatal, and there is a plant known to the Persians as *kerzerch*, the perfume of which they believe will kill a man if he inhales it after a hot south wind has passed over its blossoms. Many other plants, though not having deadly perfumes, nevertheless give forth odors which are decidedly hurtful. The *pœdaria fœtida* excites fever and headaches in those inhaling it. One of the *magnolias* emits an odor which produces in many persons nausea and sickness, and the poison sumach and poison logwood are apt to lead to similarly unpleasant effects.—*Brooklyn Eagle*.

The Life of Cholera Bacilli in Beer.

The German savant is eminently practical when it comes to beer, and as soon as the cholera assumed noteworthy proportions in Europe he set about determining the duration of life of the bacillus in his—the savant's—pet beverage. He found, according to the *Pharmaceutische Zeitung*, that the bacillus does not live beyond three hours in Pilsener, Patzenhofer or Munich beer; two hours in Berlin white beer; five minutes in white and fifteen in red wine, and twenty minute in cider. Two hours in cold coffee decoction (6 per cent.) was too much for the bacillus; but it needed five hours of rye-and-chickory imitation to kill it. In milk which had been boiled for a hour the bacilli lived for nine days, but the tenth brought them to the end of their career. Cold tea was much the same—*i.e.*, a 1 per cent. brew, but a 2 per cent. tea cleared the field in four days, 3 per cent. in one day, and 4 per cent. in an hour. The bacilli were most partial to cocoa; they did not appear to die off in that at all.

Department of Medicine at the World's Fair.

The plans for medical service, promulgated by the Medical Director of the Exposition, contemplate the maintenance of a hospital in which the more advanced modern theories will be demonstrated. A striking feature of this will be an effective ambulance service, each ambulance being accompanied by a trained nurse when called for the removal of a patient to the hospital.

Here the Board of Lady Managers perceived its opportunity, and at once began the foundation of an elaborate scheme, the establishment and maintenance of a series of movable hospitals or relief stations, at various points on the World's Fair grounds, by means of which the safety and comfort of the public would be greatly served. Patients requiring immediate attention can be taken into one of these relief stations and there receive such prompt expert care as will often render unnecessary their removal to the hospital. In addition to the opportunity thus afforded for a practical exhibition of woman's skill as a trained nurse, which was the original incentive of the Lady Managers—this plan also gave scope for comprehensive exhibits. The idea of the Lady Managers has received the most cordial approval of the Chief of Liberal Arts. Fearing, however, lest this service might be rejected by the Directory in the event of its entailing any expense upon the Exposition, those most vitally interested—the great hospitals, the makers of hospital fittings and appliances—readily agreed to establish and maintain these relief stations at their own expense, feeling recompensed by the privileges of exhibition. Large interests are represented in the united movement, the list of hospitals including such names as the Bellevue, the Mt. Sinai, the Hahnemann, the Roosevelt, the New York Hospital—all of New York City—and the great hospitals of Pennsylvania and Massachusetts.

Some Sanitary Inconsistencies.

One of the curious vagaries of modern sanitary progress is that the community has begun to look after the purity of its milk and water with so much more zeal than it does after its beer and spirits. The Massachusetts State Board of Health, for example, has spent a great deal of money and expert labor in examining spring water, rivers and cow yards. Chicago has even established a "Department of Milk," with a chemist at \$3000 a year, and nine inspectors at \$1000 a year. Their business will be to watch every place in which milk is on sale. It would be a low estimate to suppose that the country spends a million a year prying into its milk and water.

In this and every other city or town, however, saloon keepers are allowed to sell freshly-made whiskey retailed at forty cents a quart, also stale or unripe beer and other alcoholic liquors which

may contain as much fusel oil, yeast and cheap bitters as the dealer's conscience chooses. There is not much doubt that alcoholic drinks kill and injure vastly more persons than do milk and water. It is equally certain that some of the harm thus done could be prevented by the enforcement of laws forbidding the sale of impure alcoholic drinks. There has got to be almost a panicky feeling among sensitive people in regard to drinking water. Probably most of these quiet their nerves by boiling their Croton or drinking bottled waters. Others perhaps make the danger lurking in water an excuse for drinking bad wine or poorly made beer—and that means nearly all American beer. We need to inculcate a juster sense of proportion among our sanitary advisers and our law-makers.—*Medical Record*.

Worry, Drink, and Lunacy.

It is no new thing to hear of the close connection between indulgence in alcohol and the development of insanity. Accordingly, we feel no surprise at a statement by Dr. Augustine Planus that a large proportion of the cases of lunacy registered in Paris of late years are attributable to this form of excess. Far more significant is his observation that drunkenness has increased very markedly in the French capital. This effect is, of course, due to a variety of causes. Among these one is of particular interest from its bearing upon the neurotic aspect of the alcoholic dyscrasia. It is the pressure and worry of overwork, probably combined as usual in the like circumstances with irregular feeding, and want of sleep. Though felt by all classes of workers, an important characteristic of its action as a cause of alcoholism is its increasing influence among those who labor with their brains. Artists, authors, and especially journalists—a group of persons by no means usually given to excess—are enumerated as having succumbed to the subtle poison; and this result has, doubtless, with truth been attributed to the craving depression of mental fatigue. It is not difficult, indeed, to trace a connection here, and we may accept it as a warning that forced labor is ever prone to become the natural parent of other and worse excesses. The best work, however hard, is always methodical enough to permit of timely rest and of regular nutrition, and the full recognition of this fact is a mere question of public utility which we hope to see more and more widely admitted in practice.



**State Board of Health and Vital Statistics of the
Commonwealth of Pennsylvania.**

PRESIDENT,

HON. SAMUEL T. DAVIS, M.D., of Lancaster.

SECRETARY,

BENJAMIN LEE, M.D., of Philadelphia.

PEMBERTON DUDLEY, M.D., of Philadelphia.

J. F. EDWARDS, M.D., of Philadelphia.

GEORGE G. GROFF, M.D., of Lewisburg.

J. H. McCLELLAND, M.D., of Pittsburg.

S. T. DAVIS, M.D., of Lancaster.

HOWARD MURPHY, C.E., of Philadelphia.

BENJAMIN LEE, M.D., of Philadelphia.

PLACE OF MEETING,

Supreme Court Room, State Capitol, Harrisburg, unless otherwise ordered.

TIME OF MEETING,

Second Thursday in May, July and November.

**Minutes of the State Board of Health of
Pennsylvania.**

TWENTY-THIRD REGULAR MEETING.

The twenty-third meeting of the board was held at the Supreme Court Room, Harrisburg, November 10, 1892, at 4.15 P.M.

MEMBERS PRESENT.

Present—Hon. Samuel T. Davis, M. D., President, in the chair; Pemberton Dudley, M.D., George G. Groff, M.D., Mr. Howard Murphy, C.E., and Benjamin Lee, M.D.

The Secretary read a letter from Dr. J. F. Edwards regretting that, in consequence of a death in his immediate family, he would be unable to attend the meeting; also a telegram from Dr. J. H. McClelland announcing his inability to be present.

ORDER OF BUSINESS.

An order of business presented by the Secretary was adopted as the order of the day.

MINUTES PRESENTED.

The minutes of the last regular meeting held at Harrisburg, July 11, 1892, and of special meetings held at Philadelphia, August 13, September 3, September 16 and September 21 and 22, 1892, were presented.

On suggestion of Dr. Pemberton Dudley, it was ordered that the order

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of the President of the United States, of September 17, 1892, with regard to the disinfection of the baggage of immigrants, be inserted in the minutes of September 3, 1892, at the point where reference to it had been made.

MINUTES APPROVED.

On motion of Dr. Pemberton Dudley, seconded by Dr. George G. Groff, the minutes of all the meetings were now approved.

REPORT OF SECRETARY APPROVED.

(1) The report of the Secretary being in order, as its first item the Secretary read his Eighth Annual Report. Dr. George G. Groff moved and Dr. Pemberton Dudley seconded that the report of the Secretary be accepted and approved with the thanks of the board, and that, in conjunction with the minutes of the board for the past year, the same be forwarded to His Excellency, the Governor, as the Annual Report of the Board. The motion was carried. During the reading of the annual report the following action was taken on certain of the suggestions and topics therein contained :

(2) In accordance with a resolution passed at the last meeting of the board the Secretary had drafted the following regulation regarding the control of epidemics :

REGULATION FOR THE CONTROL OF EPIDEMICS.

Regulation VI.—Whenever the Secretary shall have satisfactory information that any of the following diseases, viz., smallpox, varioloid, scarlet fever, diphtheria, yellow fever, typhus fever or Asiatic cholera is epidemic, or threatens to become epidemic, in any city, borough, district or place having no local board of health, or in which the sanitary laws or regulations are inoperative, he shall have authority, as Executive Officer of the board, to issue a proclamation in the name of the board, declaring such diseases epidemic, and to order and enforce such measures in the way of quarantine, isolation of the sick, vaccination, disinfection, and the closure of schools, public and private, religious and secular, as in his judgment may be necessary to stamp out the infection.

INSPECTORS OF DAMS.

(3) In accordance with the instructions of the board, the resolution respecting the State inspector of dams had been transmitted to the Governor.

REPORT ON PURITY OF WATER SUPPLIES.

(4) The Secretary presented a printed report on the responsibility of the National and State Governments for the protection and purity of water supplies, being the substance of an address delivered by him as chairman of the Section on State Medicine of the American Medical Association at its recent meeting.

INVITATION TO AMERICAN PUBLIC HEALTH ASSOCIATION IN MEXICO.

(5) The Secretary referred to the subject of responding to the invitation of the American Public Health Association to send a delegate to attend their meeting in the City of Mexico on the 29th inst. Arrangements had been concluded for a greatly reduced rate by the railroad companies.

SECRETARY FOR DELEGATE.

On motion of Dr. George G. Groff, seconded by Dr. Pemberton Dudley, it was resolved that the Secretary be named as a delegate to attend the meeting.

INSPECTION OF NEW HOUSE OF REFUGE.

(6) Accompanied by Mr. Howard Murphy, C.E., chairman of the Committee on Water Supply, Drainage, Sewerage, Topography and Mines, the Secretary had visited and made a careful inspection of the drainage of the new House of Refuge. As Mr. Murphy was present and was more familiar with the details of the system than himself, the Secretary, seconded by Dr. Pemberton Dudley, moved that consideration of this matter be deferred until Mr. Murphy's report was reached.

CONSUMPTION IN PENAL INSTITUTIONS.

(7) Acting under instructions from the board, the Secretary had transmitted copies of the circular on consumption to the superintendents of sixty-seven penal institutions throughout the State, with a letter calling their attention to the necessity for adopting certain precautions to prevent their institutions from becoming infected with the germs of the disease, and asking for statistics of its prevalence among their inmates. Replies received up to the present time indicate that it is a rare thing for consumption to be found in the smaller county jails. The State penitentiaries had not yet been heard from.

SANITARY LEGISLATION.

(8) With regard to sanitary legislation, the needs of the State continue as they have ever been since the establishment of the board, and as the board has pressed them upon the attention of each successive Legislature—

First, the sanitary organization of the State throughout the rural districts, so that every portion of the State may have some legally-constituted local health authority.

Secondly, the compulsory establishment of boards of health in all cities.

Thirdly, the authorization and establishment of boards of health in all incorporated boroughs.

Fourthly, protection of the purity of water supplies.

Fifthly, the establishment of an emergency fund, adequate to meet extraordinary emergencies.

Sixthly, an increased appropriation for the ordinary work of the board.

Seventhly, an Act to confer upon sewerage companies the right of eminent domain through private properties.

PROTECTION OF FORESTS.

(9) A resolution of thanks had been sent to Senator Paddock for introducing a bill into Congress for the protection of forests.

IMPURE WATER AT BIRDSBORO.

(10) A complaint had been received of the impurity of the water-supply of Birdsboro, Berks County, with a request that the board inspect the reservoir and sources of supply. Mr. W. H. Boardman, C.E., engineer inspector,

was ordered to make an inspection. He reported the supply as being obtained from several small streams impounded in a large reservoir formed by an earthen dam built across a ravine. The dam was excellently located and well designed, the reservoir affording an abundant supply of water by gravitation. The nuisance was caused by a large number of old stumps and debris in the bottom of the reservoir, by the building of a brick wall laid in cement mortar across the spillway (which forced the water out of its original limits back into the woods), and the absence of a fence around the reservoir to prevent contamination by cattle. He recommended the removal of the brick wall and all other obstacles in the spillway, the clearing away of all stumps, debris, etc., and the building of a fence entirely around the reservoir, with other minor suggestions. These recommendations were forwarded by the Secretary to the local authorities.

NOMINATION OF INSPECTOR FOR WYOMING DISTRICT.

(11) Dr. L. H. Taylor, medical inspector of the Wyoming District, had recently visited Europe. He had named Dr. Walter S. Stewart as inspector *pro tem*, during his absence, which the Secretary had approved. On motion of Dr. P. Dudley, seconded by Dr. George G. Groff, the nomination of Dr. W. S. Stewart, as above stated, was confirmed.

ATTEMPTED DISINTERMENT OF BODY DEAD OF SMALLPOX.

(12) A report being received by the Secretary that some members of an Italian colony at Mill Creek, Wyoming County, were preparing to disinter the remains of one of their people who had died a few days previously from smallpox, the Secretary telegraphed the Poor Directors of that county as follows: "The State Board of Health forbids the body of John Rock to be disinterred. Arrest any one attempting it."

REPORT OF SPECIAL INSPECTOR DR. E. C. TOWN.

(13) Dr. E. C. Town, special inspector of the Pennsylvania Railroad Company, had reported on four occasions the destruction of filthy and suspected clothing and packages left on the company's property, numbering in all 678. The Secretary had approved his action, and also authorized him to destroy any trunks or boxes found to contain filthy clothing and effects.

SMALLPOX AT BUNOLA.

(14) An outbreak of smallpox at Bunola, Allegheny County, was reported by Dr. Charles H. Shaffer, of Elizabeth, on Aug. 3. Dr. J. H. Thompson had been instructed to investigate. He reported one case of confluent smallpox. He had made arrangements for quarantining the patient, and had vaccinated all the other inmates of the house, and ordered infected clothing burned and house fumigated. Notwithstanding these precautions, three other cases of the disease had developed. At a later period it was reported that gross carelessness was being shown by the County Poor Directors, who had assumed control of the cases, in allowing clothing to be used which had been exposed to the contagion, and the Secretary had addressed an energetic remonstrance to the authorities on the danger of such a procedure.

APPOINTMENT OF DEPUTY-INSPECTORS FOR LANSDOWNE.

(15) In July, last the Secretary had been requested by Dr. James E. Garretson to appoint a sanitary advisory committee to have charge of the public hygiene of the town and vicinity of Lansdowne, Delaware County. The request had been acceded to by appointing Dr. Garretson, Dr. J. Gibbons Hunt and Dr. A. D. Pennock deputy-inspectors for the sub-district of Lansdowne. On motion of Dr. George G. Groff, seconded by Dr. Pemberton Dudley, these appointments were confirmed.

DIPHTHERIA AT KIRKWOOD.

(16) An epidemic of diphtheria had prevailed at Kirkwood and vicinity, Lancaster County, during the past summer. A stringent order, a copy of which was presented, had been prepared by the Secretary and sent to Dr. T. J. Weutz, of that place, for distribution.

DIPHTHERIA AT CHADDS' FORD.

(17) An epidemic of diphtheria had also prevailed at Chadds Ford, Delaware County. An inspection by Dr. W. B. Atkinson had revealed the fact that the disease had originated in a house which had a defective drain. The drainage of a hotel was also strongly suspected of causing the water supply of the place to be polluted. Orders were sent for the abatement of these nuisances, and a deputy-inspector was appointed.

SMALLPOX AT PITTSBURG.

(18) An outbreak of smallpox had been reported at Pittsburg on July 20, by Mr. W. F. McKelvy, chief clerk of the bureau of health. There were two cases, both Italians, one of whom left before complete recovery to work in a quarry at Duubar, Pa. The Secretary had promptly notified the authorities of that place to be on guard. Another outbreak, resulting in four cases, had occurred in the same city during the latter part of September. The patients had been promptly removed to the hospital for infectious diseases, and every precaution had been taken to prevent the spread of the disease.

DYSENTERY AT STATE LUNATIC HOSPITAL.

(19) An outbreak of dysentery had occurred at the State Lunatic Hospital at Norristown, Montgomery County. In his report, Medical Inspector W. B. Atkinson, who had investigated, stated there had been seventy cases of all grades of severity, both among the patients and attendants, thirteen of the former had died, eight females and five males. The whole condition of the hospital was found to be excellent. In every fatal case the condition of the patient was such that death must inevitably have occurred in a short time, most of them being afflicted with paresis or Bright's disease. He further reported the drainage to be still under inspection, and not in the best possible condition, and from all sources of information he was led to the conclusion that the prevalence of the disease was but a milder continuance of that which prevailed last year to a much greater extent.

DEFECTIVE DRAINAGE AT NORWOOD.

(20) A complaint had been received of defective drainage at Norwood, Delaware County, and an investigation was ordered by the Secretary.

Medical Inspector W. B. Atkinson reported that the drainage of the two houses flowed into the channel of a road, and there being no outlet the sewage stagnated in front of the complainant's door. The Secretary ordered that other means be found for the disposal of the sewage.

COMPLAINT OF SLAUGHTER-HOUSE AT MUNCY.

(21) A complaint of the insanitary condition of a slaughter-house at Muncy, Lycoming County, had been received, and Dr. George G. Groff had been requested to make an inspection. He reported being unable to find any serious cause for complaint. He recommended that the slaughter-house and yard be moved back from a run on which they were located. None of the complainants could be found.

COMPLAINT OF LOCAL BOARD OF HEALTH OF NORRISTOWN.

(22) The Local Board of Health of Norristown, Montgomery County, had petitioned the board with regard to the abatement of certain nuisances in that borough. Dr. W. B. Atkinson had made an inspection and verified the complaints as to the insanitary condition of the county bridge, the fish market and a bone boiling establishment. The Secretary had addressed a communication to the borough council in regard to the fish market, and an order to abate the nuisance on the county bridge had been served on the county commissioners. The board having no jurisdiction in the matter of ordering the removal of the bone boiling establishment, no action was taken in regard to it.

DIPHTHERIA AT TRAINER.

(23) An epidemic of diphtheria had prevailed at Trainer, Delaware County, for several weeks. Medical Inspector Atkinson had made an investigation twice with regard to the sanitary condition of the village, but had been unable to find any direct cause for the disease. Several nuisances were found, and notices had been served for abatement, but these nuisances were not thought to be responsible for the epidemic.

ACTION OF UNITED STATES MARINE HOSPITAL SERVICE AS TO DISINFECT-
TION OF BAGGAGE.

(24) Reference was made to the action of the United States Marine Hospital Service in accordance with the order of the President of the United States, with regard to the disinfection of the baggage and personal effects of all immigrants from European ports.

RESOLUTIONS WITH REGARD TO IMPORTATION OF RAGS WITH REFERENCE
TO CHOLERA.

(25) The Secretary submitted copies of the resolutions passed by the Philadelphia board in regard to the importation of rags, with special reference to Asiatic cholera, as follows:

Resolved, by the Board of Health of the city and port of Philadelphia, that hereafter no rags from foreign ports shall be permitted to land at the port of Philadelphia until they shall have been disinfected to the entire satisfaction of the board, either at this port or at the port from whence shipped.

Resolved, That rags collected in or brought from places where dangerous or infectious disease prevails shall be deemed suspicious and be liable to be excluded from this port. That rags brought from other places must be accompanied with reliable evidence that they have been collected in places (naming the places) where no contagious or pestilential disease (such as cholera, smallpox, etc.) prevails.

QUARANTINE OF CHOLERA SUSPECTS AT DELAWARE BREAKWATER.

(26) In accordance with the instructions of the board with reference to the preparation of quarters for the detention of immigrants suspected of being liable to import Asiatic cholera at the Delaware Breakwater, the following telegram was at once sent by the Secretary to Dr. Walter Wyman, Supervising Surgeon-General of the United States Marine Hospital Service at Washington :

“The State Board of Health of Pennsylvania earnestly urges that your department provide accommodations on shore for passengers and crews of vessels detained by the quarantine of the Delaware Breakwater at the earliest possible moment, and, if necessary, that the government purchase an additional site for the purpose.”

REPORT OF QUARANTINE COMMISSION.

(27) The Secretary read a copy of the report of the Quarantine Commission of the National Conference of State Boards of Health on the defences against cholera along the Delaware basin.

The Secretary was glad to be able to state that the commission had expressed an extremely favorable opinion of the preparations made by the Philadelphia Board of Health for the reception of the cholera-infected ships.

(28) A copy of the instructions to the deputy inspectors who have been appointed with regard to the threatened invasion of cholera, was read.

(29) A copy of the circular on railroad inspection and disinfection with regard to cholera, was also read.

INSPECTION OF WATER SUPPLY OF ALLEGHENY CITY.

(30) A request had been received from the mayor of Allegheny City for an inspection of the water supply of that city, and a personal inspection was made by the Secretary on September 11. This investigation revealed the fact that the water of the city was being dangerously polluted by sewage from a population of about 75,000 persons in the city of Pittsburgh, in addition to the drainage from a large hospital and several small boroughs situated further up the stream. He recommended the removal of the inlet pipe to a point above the city, which would avoid the introduction of this great flood of filth, and addressed a written communication strongly urging immediate action to His Honor, W. M. Kennedy, Mayor.

CONFERENCE OF SECRETARIES OF ADJACENT STATES WITH REGARD
TO CHOLERA.

(31) At the request of the secretary of the State Board of Health of Ohio, the Secretary met that officer and the secretary of the West Virginia Board at Pittsburgh on Sunday, September 11, to consider the best means for preventing the spread of the disease through the medium of the railroads. As

the mayor of that city had been in correspondence with the Secretary on the same subject, he invited his Honor, and such prominent officials as he might approve, to be present. The whole subject was thoroughly discussed, and it was decided that the readiest means of meeting the danger, and at the same time avoiding interference with travel, was the placing of medical inspectors on trains, the furnishing of each immigrant or other suspected passenger with a certificate by the inspection officer at the port of entry, and the endorsing or punching of such certificate by the State medical inspector on crossing the State line.

Before the close of the meeting a resolution was passed requesting the Governor of Pennsylvania to place the sum of \$50,000 at the disposal of the State Board of Health to meet the existing emergency.

IMMIGRANTS RETURNED TO SHARON FROM OHIO.

(32) On the 22d of September a telegram was received by the Secretary from Sharon, Mercer County, stating that the State of Ohio was quarantining against immigrants entering Ohio at that point; two cars containing ten immigrants had been returned to that town. The Secretary at once wired as follows: "Railroad company responsible for support of persons detained. Have ordered Inspector Wood to take charge." A telegram was also sent to Dr. A. D. Woods instructing him to visit Sharon and arrange for quarantine. Dr. Woods shortly afterward reported that these persons were passed on the next morning, the reason of their detention being that they were not provided with certificates from the quarantine authorities. Several of them had been in the country two or three months.

INSPECTION OF IMMIGRANTS ENTERING PENNSYLVANIA BY BALTIMORE AND OHIO RAILROAD.

(33) In response to the repeated request of the mayor of Pittsburgh, Dr. J. S. Hackney, Medical Inspector for the Southern Tier District, was sent to Cumberland, Maryland, to inspect the immigrants entering Pennsylvania by the Baltimore and Ohio Railroad.

The approval of the railroad company and the consent of the State Board of Health of Maryland were obtained for this purpose. The report of the inspector was read.

LIST OF IMMIGRANTS TO NEW YORK AND PHILADELPHIA FROM CHOLERA-INFECTED PORTS.

(34) The Secretary presented a list of the steamships which had arrived at the ports of New York and Philadelphia bringing immigrants, on board of which were cases of contagious disease, or which had sailed from cholera-infected ports. The burgesses and health officers of the several places for which these immigrants were destined were notified of their arrival, and highly appreciated this information.

INSPECTION OF DRAINAGE AT JOHNSONBURG.

(35) A complaint had been received of defective drainage at Johnsonburg, Elk County. Medical Inspector Spencer M. Free had investigated the matter. He reported that the nuisance was caused by the railroad company refusing to allow the sewer from an hotel, the buildings of a real estate com-

pany and of a manufacturing company, to pass under the tracks. The company was willing, however, to grant this permission to the borough authority. The Secretary had addressed a communication to the borough authorities urging the immediate construction of a proper sewer.

REPORT OF INSPECTION OF PROPOSED PLAN OF SEWERAGE AT
LANSDOWNE.

(36) Application had been made to the board for an inspection of Lansdowne, Delaware County, with reference to a proposed plan of sewerage.

Mr. W. H. Boardman, C.E., Engineer Inspector for the Eastern District, was directed to make an inspection. His report, which was now read, stated that the only mode of disposing of the sewage at present was by means of an open ditch passing through the town and emptying into Darby Creek. This open sewer he characterized as an abominable nuisance. A plan proposed by several influential residents to abate this nuisance was under consideration, viz., by laying about 10,000 feet of eight, six and five inch sewer pipe to a receiving well to be located on Darby Creek.

The inspector had been advised that a company had been formed to build a large intercepting sewer along Darby Creek from Berwyn to a point above Clifton. This proposed sewer would pass somewhere in the neighborhood of the proposed Lansdowne disposal field. He recommended that the board approve of a properly designed sewerage system throughout Lansdowne and vicinity to discharge into Darby Creek, provided the best obtainable temporary means be adopted to purify the sewage before discharged; and provided, that the whole system be so designed and located as to form part of a comprehensive sewerage system for the entire Darby Creek valley, and provided, that nothing be done or maintained which shall be prejudicial to the public health.

Mr. Howard Murphy, C.E., moved, and Dr. George G. Groff seconded, that the report of the engineer be accepted and the suggestions made therein approved by the board. The motion was carried.

SMALLPOX AT NEW CASTLE, PA.

(37) On the 19th of September a telegram was received from Dr. C. O. Probst, of Columbus, Ohio, asking if the board had any information of the existence of smallpox at New Castle, Lawrence County, Pa. In response to a telegram the mayor of the city reported that there had been four cases of the disease, one of which had proved fatal. The first case, that of a young woman (the origin of which could not be traced), was diagnosed as chickenpox. Hence many persons had been exposed. The cases were being quarantined by policemen, and every precaution taken to prevent the disease from becoming epidemic. Dr. J. R. Thompson was directed to make an inspection and report. After investigation he reported that every precaution was being taken as regards isolation of the patients, vaccination and disinfection. As a result of the mistaken diagnosis fifteen cases developed, one of them being in the person of Dr. Bell, deputed by the borough council to attend the cases. The epidemic had now been brought under control.

SMALLPOX AT M'KEESPORT.

(38) Two cases of smallpox had also occurred at McKeesport, Allegheny County, of which the Secretary had been notified by Mr. H. C. Wallace, Secretary of the Board of Health. The cases were promptly isolated, and stringent precautions taken. Dr. J. R. Thompson, who made an inspection, reported in reference to the first case that the patient had sat near a sick lady on a train, and this was supposed to be the cause of the two cases. Everything necessary was being done to stamp out the disease.

CHOLERA PROCLAMATION.

(39) The Secretary presented a proclamation with regard to cholera which had been issued by the burgess of Huntingdon, and which he commended for its promptness and vigor.

INSANITARY CONDITION OF ITALIAN SETTLEMENTS AT WAYNE.

(40) Complaints had been received of the insanitary condition of an Italian settlement at Wayne, Delaware County, and Dr. W. B. Atkinson was instructed to make an inspection. He reported the settlement as being a collection of fifty huts, which served as shelter for two squads of men, mostly employed in a quarry contiguous thereto. On one side were two closets set apart for nearly 100 men, and on the other one closet for about fifty men. The ground showed that it was used for the deposit of human excreta in every direction. Surface drainage was provided, and the ground was strewn with refuse food, slops, old clothes, etc. The entire settlement was a menace to the health of the residents in the immediate neighborhood. Instructions had been sent Mr. H. Pleasants, the deputy inspector for the subdistrict, and he was keeping a very strict watch on this settlement.

COMPLAINT OF SLAUGHTER-HOUSE AT MORRELVILLE.

(41) Complaint had been made by affidavit of the insanitary condition of a slaughter-house at Morrelville, Cambria County, and Dr. W. E. Mathews, medical inspector, had been instructed to make an inspection. His report fully confirmed the complaint, which he described as being due to the depositing of the blood, offal and other slaughter-house refuse in a stream. He recommended that the proprietors be prohibited from polluting this stream with slaughter-house refuse. The Secretary had sent an order to cease making such deposit.

CORRESPONDENCE WITH THE BURGESS OF COOPERSDALE, ABATEMENT OF NUISANCE, DEPUTY INSPECTOR, ETC.

(42) The Secretary read a letter from Mr. Peter Felix, burgess of Coopersdale Borough, in reference to the sanitary condition of the town. He had replied, and had commended Mr. Felix for the excellent work already done. He had also appointed him a deputy inspector. The Secretary had also sent an order for the abatement of a nuisance at a tallow factory in the borough. He had pointed out to Mr. Felix that this board had absolutely no authority to compel the construction of sewers, as this power rested entirely with council.

CONFERENCE BETWEEN THE SECRETARY, THE CHAIRMAN OF COMMITTEE
ON WATER SUPPLY, ETC., WITH PHILADELPHIA BOARD OF
TRADE; RESOLUTIONS RECOMMENDED.

(43) By request, the Secretary, accompanied by Mr. Howard Murphy, C.E., chairman of the Committee on Water Supply, Drainage, Sewerage, Topography and Mines, had held a conference with the Committee on Water Supply of the Philadelphia Board of Trade, and the committee's report of this conference was now presented. The following preamble and resolutions were recommended by the committee:

WHEREAS, the epidemic of cholera which has reached the borders of the United States demands the most energetic and vigorous action at the hands of the proper authorities to prevent its entering Pennsylvania and other States; therefore, be it

Resolved, That the Philadelphia Board of Trade memorialize the legislature of Pennsylvania to grant to the State Board of Health police jurisdiction over all the drainage areas of Pennsylvania from which water supplies are taken.

Resolved, That the municipal authorities and trade organizations of Philadelphia and other cities and towns bordering on the Schuylkill River, which take their water supplies from that river and its tributaries, be requested to act with the Philadelphia Board of Trade in obtaining the needed legislation in this vital and important matter.

PREVENTION OF INSANITARY CONDITIONS ALONG THE LINE OF THE
WILKES-BARRE & EASTERN R. R.

(44) Complaint having been made that a large number of foreign laborers, employed in the construction of a line of railway known as the Wilkes-Barre and Eastern R. R., might cause insanitary conditions in the neighborhood of the health resort of Mt. Pocono, the Secretary communicated with the president of this railroad company. A prompt reply was received from this gentleman, stating that the company had already been in correspondence with Dr. Charles McIntire, Jr., medical inspector of the Lehigh District, on this subject, and also with Dr. L. H. Taylor, medical inspector of the Wyoming District. The president further stated that the company would gladly coöperate with the board in the prevention of any insanitary conditions, and suggested that in the first instance the board notify all contractors along the line, whose names and addresses were annexed. The Secretary at once addressed a warning communication to all these contractors, eleven in number, pointing out the importance of unusually strict sanitary precautions in regard to the habits of their workmen and laborers in consequence of the danger of the arrival of cholera in this country from Europe. A copy of this letter was presented and read.

INVESTIGATION OF WATER SUPPLIED BY THE HOME WATER CO.,
OF ROYERSFORD.

(45) A communication had been received from Mr. George D. Peters, burgess of Spring City, Chester County, Pa., stating that the water supply of that place, supplied by the Home Water Co., of Royersford, was contaminated. The Secretary at once wrote the company, asking for an explana-

tion. The reply of Mr. J. H. Buckwalter, president, was to the effect that the water supply originally was from an artesian well. This source had, however, owing to the increased demand, become inadequate, and a portion had now to be drawn from the Schuylkill. This was only a temporary arrangement, additional works being now in progress of construction. The residents of Spring City had probably judged the water more by the temperature than from a standard of purity, that from the artesian well being much colder than the Schuylkill water.

COMPLAINT FROM BRYN MAWR RESIDENT OF LOCATION OF PROPOSED COLLEGE HOSPITAL.

(46) A complaint from a resident of Bryn Mawr, Montgomery County, that the Bryn Mawr College contemplated using an abandoned laboratory as a hospital for contagious diseases, the location of which was likely to endanger the health of residents in the immediate vicinity, was investigated by Dr. W. B. Atkinsou, medical inspector. His report stated that at present there existed no need for prohibition of this building for the purpose proposed.

SLAUGHTER-HOUSE NUISANCE NEAR BOLIVAR.

(47) A complaint of the insanitary condition of a slaughter-house situated just outside the borough limits of Bolivar, Westmoreland County, was investigated by Dr. W. B. Mathews, Medical Inspector. He reported that all the blood and other filth from this slaughter-house was run into a water course, which ran through church property and that of the complainant. The water course was often entirely dry, the slaughter-house filth decomposing in it. The whole premises were also in a filthy condition. The Secretary at once sent an order of abatement, which was served by a constable of West Fairfield, who reported on his second visit that the nuisance had been abated.

ALTOONA RESERVOIRS.

(48) The Secretary read a communication from Dr. C. B. Dudley, of Altoona, Medical Inspector, which stated that one of the city reservoirs was being cleansed, and that a quantity of the excavated matter was being so placed it was feared that much of the liquid portion would find its way into the reservoir again. The reply of the Secretary, which was now read, pointed out the danger of this poisonous organic matter, which probably contained the germs of disease, being allowed to drain into the reservoir. The necessity for having all public water supplies in a condition of the greatest attainable purity during the coming year, in view of the strong probability of the introduction of Asiatic cholera, was also pointed out.

RESOLUTION WITH REGARD TO CLEANSING OF RESERVOIRS.

Mr. Howard Murphy, C. E., moved, Dr. Pemberton Dudley seconded, and it was

Resolved, That it is the sense of this board that all reservoirs or dams in the State from which water is drawn for domestic use should be thoroughly cleansed as early as possible during the spring of 1893, and that after being made as clean as possible, the bottom and sides or slopes, and

all surfaces which will come in contact with the water when the reservoir is refilled, be thoroughly whitewashed, or otherwise treated with as thorough an application as possible of lime. This recommendation applies to reservoirs and dams with earthen surfaces, as well as to reservoirs which are paved or lined. In all cases the silt and other débris and material removed from any reservoir or dam should be so disposed of as to preclude the possibility of its being again washed into the water supply by storms or otherwise.

On motion of the same gentleman, seconded by Dr. George G. Groff, it was ordered that a copy of the above resolution be sent to Dr. C. B. Dudley.

SMALLPOX AT ALLENTOWN FROM NEW YORK.

(49) On the 30th of October the Secretary was notified of a case of smallpox at Allentown, Lehigh County, in an Italian shoeblack, who had recently visited the city of New York to attend a Columbus fête. Dr. J. D. Christman, health officer, stated that the case was promptly isolated by removal to the county pesthouse, bedding destroyed, and house fumigated and quarantined. The Secretary had mentioned eighteen days as the proper period to quarantine, in case no other person was taken sick. This was the second case of infection with smallpox at the New York festival.

PAPER BY DR. JOHN B. HAMILTON.

(50) The Secretary presented a copy of a paper by Dr. John B. Hamilton, surgeon United States Marine Hospital Service, on the "Establishment of a National Quarantine Station near New York Harbor." The further consideration of the paper was referred to new business.

DEATH OF DR. THOMAS WOOD.

(51) H. T. Bahnson, Esq., president of the State Board of Health of North Carolina, had notified the Secretary of the death of Dr. Thomas F. Wood, secretary of that board. On motion of Dr. George G. Groff, seconded by Dr. Pemberton Dudley, the Secretary was directed to express the sympathy of this board with the North Carolina board in view of the decease of Dr. Wood.

DUMPING OF GARBAGE INTO OHIO RIVER.

(52) Mr. J. O. Brown, chief of the Department of Public Safety of Pittsburg, had asked the advice of the Secretary with regard to the dumping of garbage into the Ohio River. The current being very slow at the place where the matter was dumped, the water was in danger of being seriously contaminated. He suggested dumping the stuff below Davis Island dam.

The Secretary had replied expressing surprise that such a condition of affairs existed in Pittsburg, and absolutely condemning the present system of garbage disposal, and recommended either dumping the same below Davis Island dam, or still better, subjecting it to rapid oxidation in the crematory owned by the city.

[TO BE CONTINUED].



This department is designed for the description of improved Sanitary Appliances and Medicinal Preparations introduced by patrons of The Annals. The matter is not paid for, nor can it be classed as advertising. But as the information is necessarily obtained from those who offer the appliances for sale, it is proper to say that the manufacturers, rather than ourselves, are responsible for the statements made.

The Sanitary Garbage Pail.

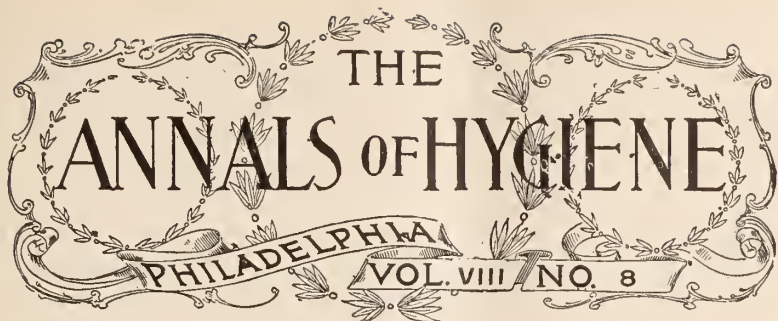
AN article of much utility, especially in crowded cities, where the subject of the proper care of garbage is of the greatest importance, is the sanitary garbage pail, manufactured by an enterprising western firm. This pail is constructed of galvanized iron with a wooden casing. The can and its surroundings can thus be thoroughly cleansed after each emptying. The attachment is so constructed that it can be affixed to the back fence, with a panel cut to allow of its contents being emptied by the collector from the alley. This panel is fitted with a padlock, a key to which may be carried by the collector, who removes the entire can from its position in its iron bearings, carries it to his wagon, empties it and returns it to its original position, after which he locks it and drives on. This arrangement of removing the pail from the fence avoids all possibility of scattering the garbage about the premises, which often happens when other methods are employed. The cover is automatic, and closes itself at all times. This effectually keeps out flies, and prevents the contents of the pail being disturbed by animals. It can be readily detached for removal to other premises. It is made in two sizes—ten and twenty gallon.

Formalin.

A NEW germicide, which has the merit of being harmless, except so far as the destruction of disease germs is concerned, is manufactured by the Chemische Fabrik auf Actien, in Berlin, Germany, to which they have given the name of Formalin.

It is a chemical disinfectant, experiment having been made in accordance with the known anti-bacterial action of formic aldehyde. As now prepared it consists of a percentage of formaldehyde dissolved in water. This has been proven, by actual trial, to be equal in germicidal destruction to sublimate, while being entirely free from the poisonous qualities of the latter. Its properties, briefly expressed, are as follows: 1. It has an extraordinarily active microbicide power, similar to that of sublimate. 2. It is comparatively non-poisonous. 3. It attacks only the substance of the contagious material, leaving intact the articles treated, whether of organic or inorganic nature. 4. It is very readily employed under all circumstances, either as liquid or in gaseous form.

Messrs. Schering & Glatz, 55 Maiden Lane, New York, will furnish additional information in regard to this preparation. They are the sole representatives of the manufacturers in the United States.



COMMUNICATIONS.

A Plea for Outdoor Sports in Middle Life.¹

BY JOHN GRAHAM, M.D.,
Of Philadelphia.



HE physician's object is not alone to cure ; his higher mission is to aim at the prevention of disease. To this latter end he endeavors to destroy or neutralize the germs of disease and their products, and to produce such a condition of bodily health and vigor as will enable the individual to be proof against the entrance of disease. Chief among the means to establish this resistance he recommends outdoor exercise.

With a like object in view our colleges have employed skilled teachers to develop the physical as well as the mental powers, and their successful after-results are seen among our young men and men of middle life, and handsome girls are not ashamed of brown faces and well-developed muscles.

Unfortunately, when college ceases, the exercise ceases, and educated Americans past thirty are wild to see a base ball match, but seldom think of taking part in the play. The latter is left to paid professionals ; and of all who have lapsed in this respect the doctors lead the van. The words athlete and sport attached to a doctor's name fill him with professional horror, and if perchance he does partake of the forbidden joy, he sneaks away, as if to the commission of a crime.

¹ From the Medical News.

How different it is with our English cousins. The educated Englishman of middle life, even when he affixes M.D. to his name, is proud to be known as an athlete, and the English public has learned that a man may be a good physician as well as a good cricketer.

Some years ago a team of amateur English cricketers visited Philadelphia and vanquished a picked eleven of Philadelphians on Saturday. On the following Sunday the English captain, Rev.—, preached a first-class sermon in one of our churches. Like instances are numerous in England. How rare in America!

Uneducated to the pleasure and advantages of outdoor sports, the mental laborer, wearied in mind and body, too often turns to cards, chess or billiards—midnight games, with their dangerous associations, loss of sleep and gambling. Oh, that such a one could feel the keen joy and exhilaration of him who follows a pair of setters in search of quail on a crisp clear day in November.

No one advanced in years can indulge in outdoor sports with skill, pleasure and benefit unless he has followed it from youth to manhood and so on through life. Therefore, I would urge our boys to continue their favorite sport, and we should assist them early in life to select one, the pursuit of which will least interfere with their individual life-work.

If the desire exists, the opportunity will generally be found, and the man of sixty, equally with the boy of sixteen, can enjoy his horseback, cricket, or gunning; but the desire, with the physical ability to exercise it, will only exist when fostered from youth, and suitably used and not abused.

Many, myself among the number, prefer gunning, and I think it has certain advantages. Its indulgence means early to bed and early to rise. There is no loss of sleep or owl work in this sport; no confinement in close rooms or vitiated atmospheres; but, far removed from the din and bustle of the great city, in the fields and woods, and with no cover but the sky, and surrounded by pure oxygen—there, and there only, can this sport be indulged in.

Its surroundings are not such as conduce to intemperance, either in eating or drinking. No *table d'hôte*, imported wines, or Havana cigars are found in the humble abode that generally shelters the gunner, and a whisky-bedimmed brain but ill fits one who carries in his hand a weapon which handled carelessly or

ignorantly may deal out death, not to birds, but to the gunner himself, or still worse, to his comrade. Therefore, gunners should be, and generally are, temperate.

Some English experts recently said that American working-men accomplished as much in two days as their men did in three. In our professional life we pursue the same rush. There is all work and no play. As a consequence, the roadside of life is strewn with the physical wrecks and dead bodies of those who have fallen before they reached full mental development.

The age at which reason and judgment are at their best is nearer fifty than forty years, yet how many physicians wear themselves out in the thirties.

A professional gentleman told me recently that he rested himself by studying geology. Some others in the search for relaxation write on subjects outside their own calling, substituting one form of mental work for another, and claim that it gives them the required rest; but how illogical! What would we think of the bricklayer who for rest would help the carpenter? For true rest, the wearied mind must cease all labor, and better still, fly to outdoor exercise.

The phrase "fat and forty," unkindly applied to women, might with equal truth be applied to many of the male sex who lead a mentally active and physically lazy life. With from twenty to forty pounds of extra flesh, which adds but weight to be borne by their soft and flabby muscles; with hearts weakened by muscular atrophy and fatty degeneration; short of breath and always tired; such too often completes the picture of the men who are not and never were lovers of outdoor sport.

Of their opposites I saw a dozen recently at the cricket grounds; men between thirty-five and fifty years, with spare frames, hard muscles and clear bright eyes, and although engaged in active play showing no signs of fatigue. Almost without exception these were men who had won success by mental labor, and every one had continued from youth to the present his favorite active exercise.

A Long-lived Family.

A family of five brothers and two sisters, whose united ages amount to 549 years, an average of 78.3 years each, are living, all in excellent health, in St. Ives, England.

The Collection, Removal and Disposal of Garbage and Dead Animals at St. Paul, Minnesota.¹

BY HENRY F. HOYT, M.D.,
Commissioner of Health.



BELIEVE it is sometimes customary, in commencing a paper of this kind, to announce that the subject under consideration is the most important one in the range of sanitary science. While I shall omit the "customary," I must confess that during the period of six years of active, practical sanitary work as executive officer in the Department of Health in the city I have the honor to represent, that the one bugbear, the nightmare of the health officer's dream, the most vexatious, irrepressible, apparently never-to-be-overcome or settled problem, was that which adorns the title page of this manuscript, "The Garbage Question." All things, however, must come to an end, and our natural persistency, obstinacy and perseverance have at last been, at least, temporarily rewarded, and I shall take great pleasure in describing to you as plainly and briefly as possible the details of the system now in operation in our city, which is the result of a number of years of investigation, experimentation and toil in this special direction. Not that I have anything new or novel to offer, but more that I may get the benefit of your criticism and suggestions during the discussion that I hope may follow the reading of this paper is my apology for its presentation.

COLLECTION OF THE GARBAGE.

In about one-quarter of the area of the city, the most populous portion, the collections are made daily between the hours of midnight and nine o'clock A. M. The remainder of the city is provided with a tri-weekly service, at any hour that suits the convenience of the contractor. The entire work of collection, removal and disposal is done by contract by one company. The people are required by law to provide suitable and proper recep-

¹ Read before the American Public Health Association, at a meeting held in the City of Mexico, December, 1892.

tacles for their garbage, which must not be too large for convenient handling, must be made of either hard wood or some metal (preferably galvanized iron), must be tightly covered, cleansed and disinfected at regular intervals, and must be placed or kept at a point on the premises most accessible to the scavenger. The law also provides as to what shall constitute garbage. No ashes, sticks, stones, etc., are allowed to be put in with the animal or vegetable matter, the one exception being tin cans. For persons violating the provisions of this ordinance the penalty of a fine is provided. The garbage is emptied from the receptacles by the scavenger into hard wood casks of a capacity of about forty-five gallons. Five or six of these constitute a one horse load, and in the districts where the double teams are used from ten to twelve are carried. These casks are provided with hard wood covers by which the casks, when filled, can be hermetically sealed by means of an iron rod attached to the bottom of the cask, extending up the centre through the lid, and being provided at the top with a powerful hand screw. These casks when filled are carried to a convenient location, loaded into box cars, transported into the country some fifteen or twenty miles, there unloaded and contents put through a system of reduction that converts them into a fertilizing material. The casks are then thoroughly cleansed and returned to the city for another load, the entire system, from the time the casks are filled at the homes in the city till they are emptied twenty miles away, being absolutely free from unpleasant odors or anything that could be construed into a nuisance.

DEAD ANIMALS.

These are collected in a kind of covered wagon constructed for the purpose, conveyed to the train, transported to the same location as the garbage, and there rendered into tallow, fertilizers, etc. The company doing this work have selected a very barren piece of land for their works, and expect in the course of time to have it blossoming like a rose.

THE DISPOSAL OF GARBAGE.

Some of you may wonder why we ship all this material twenty miles into the country. I will try to explain. During the past six years I have read many reports and descriptions of many different systems for the disposal of this refuse material ;

traveled many miles, personally examined, tested and inspected many plants, crematories and systems relating to the subject ; have listened to a number of long, learned and interesting papers, as have numbers of my patient audience, upon the same subjects that have been presented to this honorable association at various times, nearly all of them endorsing one system or another as being almost perfect for the purpose intended, a system that could be operated in the heart of any city at any time without being a nuisance. In fact, from *some* of the descriptions one could almost imagine that he would gladly pay a bonus to be allowed to erect a home in close proximity to one of these garbage plants, so flowery and free from nuisance and such adjuncts to health are they. Gentlemen, did any of you ever undertake to run one of these garbage perfume manufactories in the heart of a city? I have, and dismally failed. It is *my* candid and honest opinion that there *are* one or two systems that are nearly all that is claimed for them. Yet I would earnestly advise that while you may *claim* for them everything in sight, if you are thinking of locating one in your respective location go just a little way out of town with it. Why is this? My experience has taught me to believe that the nomenclature is wrong. You attach the word "Garbage" to a bran new empty, covered wagon, allow it to stand on a street in a thickly populated district, and I firmly believe that in a very short time a large per cent. of the adjacent populace would be under medical treatment or threatened with some dreadful pestilential disease ; the air would be full of petitions to the health department, injunctions, threats, etc. This is not overdrawn, for I have experienced just such an absurd performance as I have described. So until the names can be changed, dispose of your garbage and refuse material on the outside.

COST OF THIS WORK.

The scientific sanitary expert, laboring and toiling as he does, devoting his life's work to the noble and unselfish effort of endeavoring to improve the condition and prolong the lives of his fellow beings, has very little opportunity or leisure to pay any attention to the actual cost in dollars and cents that the practical application of the result of his studies and researches entails. That part is left to the health officer, who, between his knowledge of what he *could* and what he *ought* to do had he but the ways and means on the one side, and the often too meagre appropriation

that is grudgingly doled out to him by those in power on the other, is in a position that is often not enviable. But I am digressing. Our city has a population of 150,000. There are 20,000 houses from which garbage is collected, to accomplish which over 350 miles of streets have to be traversed. It is estimated that we have 75,000 tons per annum of all kinds of refuse. Of this 15,000 tons is garbage and dead animals, or about fifty tons per day. Estimating 300 working days in the year, to collect, remove and dispose of all garbage and dead animals from our city in the manner I have described costs \$1.51 per ton, or about 15 cents per capita per population per annum, the contractor being paid at the rate of \$22,700 per annum. The contractor is required to furnish under oath to the Department of Health a monthly report that must state the name of each street, number of each house, and the number of calls made at said house during the month. If he fails to remove the garbage after being properly notified and complaint is left to that effect at the Department of Health he is fined twenty-five cents for each and every such complaint. If 100 complaints come in, the Council have the right to cancel the contract should they so desire. The entire work is under the direct orders, control and supervision of the Department of Health.

National Quarantine as Constituted and Administered in France.¹

BY HENRY B. MILLARD, A.M., M.D.,

Foreign Corresponding Member of the French Academy of Medicine.



ANY of the following statements I have recently presented, and most of this paper, to the Board of Trade and Transportation, -whose efforts to ascertain the comparative value of State and national quarantine are worthy of the greatest praise as regards their thoroughness, energy, and the extreme relevance of all their questions to the accomplishment of its purpose.

In regard to the first question they propound, relative to the quarantine administration in foreign countries as furnishing pre-

¹ From the Medical Record.

cedents for the United States, I would say that I am able to speak with precision of the system of quarantine in France, as I have passed a great deal of time in that country, and being in Paris a great part of last summer was more or less in communication with the health authorities, general and local. I believe that the French system demonstrates the great value of a properly organized national quarantine.

(1) Quarantine is administered throughout France in accordance with a law passed in 1876.

(2) The provisions of this law are carried out under the direction and advice of a body entitled the Comité Consultatif d'Hygiène Publique de France.

(3) The functions of this body are not to make any new laws but to see that existing laws are executed, and to act as an advisory body to the Ministry of the Interior in regard to such measures as seem to this council well or badly employed.

(4) This body is charged with the investigation and study of all questions referred to it by the Ministry of the Interior, especially those which concern the marine sanitary police quarantines and their service, and the necessary measures to take for the prevention and combating epidemics. This committee acts also, I may add, as an advisory body, in all other questions of public health, lodgings, water, food, the sale of medicines, etc. Practically, it constitutes the real board of quarantine, as its councils, I may say, are almost invariably followed.¹

(5) The committee is composed of thirty-four members. Twelve of these are members *ex officio*, and are as follows: The Dean of the Faculty of Medicine of Paris, the Perpetual Secretary of the Academy of Medicine, Inspector-General of Sanitary Service, Director of Public Charities and Hygiene, the President of the Committee on Health of the Army, the Inspector of the Service of Health of the Navy, the Director General of the Customs, the Director of Public Charities of Paris, the Director of Commerce of the Interior, the Inspector-General of Veterinary Colleges, the Inspecting Architect of Thermal and Sanitary Buildings. The others are appointed by the Minister of the Interior, and

¹ The sphere of the Committee of Hygiene of France is very extended. It embraces all hospitals, insane asylums, private and public, benevolent institutions, hygiene and public health, sanitation of villages and cities, lodgings, food and its falsification, examination of fresh meat imported into France, epidemics in France, sanitary statistics, sanitary missions, maritime police sanitation and of coasts, *Lazzaretti*, quarantine measures, the practice of medicine and of pharmacy, the sale of poisons, mineral waters, etc.

are at present composed of seven professors in the Faculty of Medicine of Paris, of whom one is a senator ; the other members comprise the Inspector of the School of Mines, the Director of the School of Pharmacy, the Inspector of Benevolent Institutions, the Secretary-General of the Superior Council of Public Assistance, the Director of Statistics of Paris, a professor in the Institute of Agriculture, the Chief of the Laboratory of Toxicology, two or three hospital physicians, and Pasteur, member of the Institute of France, etc. The executive power of this body is delegated to a committee of three, composed at this moment of Brouardel, Dean of the Faculty of Medicine, Member of the Institute and of the Academy of Medicine ; Proust (not the Deputy), Inspector-General of the Sanitary Service of France, perhaps the best-known writer upon cholera in France, and who was twice sent to the East to study the disease ; and Monod, Director of Public Charities and Hygiene. The members of the council sign a bulletin attesting their presence, and a member receives, for each meeting he attends, fifteen francs. Certainly not a sufficient sum to enable him to squander much of the public money !

It is interesting to note the composition of this body. Perhaps, except that of Pasteur, the names of the medical members are not well known here, but are well known in the medical world ; the others, by their official positions, cover everything on sea and land connected with sanitation.

Now as to the results of the labors and influence of this body : I have myself witnessed some of these. I was in Paris much of the time in July, August and September, 1884, while the cholera was raging fiercely in Toulon, Toulouse and Marseilles. Though the latter city is only thirteen hours from Paris, and the communication was extensive, not a single case of cholera occurred in Paris till early in November, when there were a few cases, the first case being brought from Fecamp, a small seaport in Normandy, a few hours from Paris. The quarantine regulations were admirable. Every traveler from Spain or the south of France was obliged, on his arrival, to report within a certain number of hours to the authorities, stating from what locality he had come, his address in Paris, and the condition of his health. If the formality were neglected, imprisonment usually from two to five days followed very promptly. In addition, travelers from certain localities were subjected to thorough fumigation at the stations. This year the executive committee of the council made at least

two visits to Havre while the epidemic was at its height, and, in co-operation with the municipal authorities, enforced such orders and such thorough process of cleaning that the epidemic was stamped out, considering its virulence, in a reasonable time. The first case occurred August 2, and the last toward October 4. Last summer this committee established an effective quarantine between the Austrian and German frontiers and France, travelers entering France from these countries being subjected to careful inspection and, in necessary cases, detention. Their soiled clothing was taken from them, fumigated, washed, ironed and sent in a few hours to the traveler's destination, and this at the simple cost of carriage. It may be asked, if the French national quarantine be so efficacious, how could the cholera have been introduced so easily from Hamburg to Havre, as is usually supposed it was? I am glad to be able to contradict this belief. The first case of cholera occurred at Havre, August 2, the first in Hamburg, August 11, and between August 2 and August 11 it had become quite prevalent at Havre. It is true that there were a large number of deaths from cholera in Paris this summer, the week ending September 8 there being 177, and the week ending September 15, 148 deaths, these occurring in the city, irrespective of the suburbs, but I believe it was sporadic or cholera nostras, and was not brought in.¹ It commenced toward the middle of June in a very mild form, and long before its appearance in Havre or Hamburg. It was a theo yrof several competent authorities in Paris that it was conveyed from that city to Havre. It did not, however, assume a severe form till the last week in August. There are two facts of interest relative to the mortality from cholera in Paris this summer. The water supply of Paris has been for several years insufficient, and so costly that many arrondissements (or wards) have been obliged to drink the water of the Seine (boiled or not as they chose), which last year was unusually low and dirty. It was in these arrondissements that the greatest mortality prevailed. In the three quarters, that of the Louvre, the Champs Elysées, and the fourteenth arrondissement (on the left bank of the Seine) which are the healthiest of Paris, there were not altogether more than nine or ten deaths. The next smallest mortality was in the ninth (Montmartre), which is on a height, and very clean. The greatest was in La Villette (the nineteenth) the rag-pickers'

¹ I am indebted for the useful abstract of the voluminous *statistiques municipales* of Paris, for the above data relative to that city, to the Medical Record of December 17.

quarter. I have been unable to ascertain that outside of Havre and Paris there have been more than forty or fifty deaths up to date of this writing in the whole of France.

As to the question of a national quarantine: "Whether it would afford increased security to the country?" I would answer: If properly managed, it should. The outposts and ports of the country should be subjected to surveillance by the Government, with the same care that they are watched to prevent the entrance of contraband goods. The sanitary cordon should be as strict as was the military cordon between the Union and Confederate outposts during our war. But it is not possible for one man, without sufficient resources, to cope with such a formidable condition of things as was suddenly developed here last summer. It is not to the point whether he could have done more. There was, however, conflict of authority; unsuccess in simple questions of transportation which any shipping merchant or railroad man could have solved at once; there were panic and confusion. Neither Government nor State did well; people were subjected to hardships and privations such as belong to war and siege. The same regulations and laws, proceeding from one central source, the national Government, should apply to every port in the country. Harmony of action could then prevail in the whole length and breadth of the land, from the temperate to the torrid zones. The senseless panics which led a town in Texas to quarantine goods purchased in New York, and to subject vessels to long quarantine at Havana and Malaga, after the disappearance of the cholera here, and which inspired one of our ablest daily papers to write editorially: "Better that every passenger in all the ships on the Atlantic be drowned in the sea than that any one of them should introduce the Asiatic monster into our great city."

This fear of our countrymen throughout the country of cholera, as manifested this year, is not without interest as a psychological phenomenon. There were only eight absolutely proven deaths from cholera in this city, yet the whole country was in a state of trepidation. In Paris there were altogether eight hundred and twenty-eight deaths, besides numerous deaths not far outside the walls, and three or four hundred deaths daily at Hamburg and Havre, only four to eighteen miles by train from Paris, but no anxiety nor fear was felt. Yet the French are considered more excitable than we are. I do not believe, except in the matter of rapid speech and gesture, that they are so much so. Is our cour-

age mostly of the physical kind? Undoubtedly a press, incendiary from a choleraic standpoint, and bad quarantine, produced the panic. There is, too, a great deal in a name, as well as in what the papers say. The mortality from the grippe, three years ago, was frightful, but little alarm was felt. Cholera is a scourge not more to be dreaded by people who can live under the dominion of the goddess Hygeia than is the grippe.

At the same time, though national quarantine is best, it would not be desirable if it were placed within the power of the Secretary of the Treasury to detain for several days vessels from a non-infected port and with a clean bill of health, as was done this month in the case of *La Bretagne*, and early in November in the case of another vessel of the French line. A national quarantine which did not know how to manage healthy ships from healthy ports would not be an advantage, at least to commerce.

I do not believe in State quarantine, but I believe less in a mixture of it with national quarantine, although this, to be perfect, would necessarily have to co-operate with all local boards of health. I cannot see but that a national quarantine, somewhat on the plan of the French, should fulfill every purpose.

How I Became Interested in the Care of the Teeth.

BY LUCELLA COOL,
Of San Francisco.



HAVE had some varied experiences in dentistry since my advent into the profession. I was married at an early age to a dentist, and at first my idea of the profession was one of horror, and upon occasions of extracting I would clap my hands over my ears and run for blocks. I gradually became interested, as I was often called in by my husband to assist him with a nervous patient, and I had perfect control over them, quieting their nervousness and fears, and many a painful operation was performed if I would only hold their hands. Then my interest grew to love of the profession, and I started in to

watch every move, questioning why such and such a thing was done or such a medicine used and its action. I read and studied, and when my husband was taken ill for several months I took charge of his office and practice, attending to his patients and retaining them, and after his recovery it was a common thing for people to come in and ask for Mrs. Cool to operate for them.

Ten years I assisted him, and when, three years ago, I was forced to earn my own livelihood, I started an office in the Chronicle Building of San Francisco. My first year was a very hard one, as people doubted a woman's ability, and the fight was one well known to all professionals, but much harder due to my sex. Hope kept me buoyed up, and I never allowed the word fail to present itself to my mind, but I said, "I will succeed," and I have, beyond my expectations. My practice is now as large and fine a one as in San Francisco. I made up my mind to instil into my patients the idea of cleanliness as a sure preventive to arrest decay of the teeth. I gave them all Listerine to use as a mouth wash every night before retiring, it acting as a purifier and antiseptic.

There are many different causes concerning the decay of the teeth, but when once the teeth are all filled and are watched carefully and kept clean there is little cause for decay. Clear water will not obtain this object. To keep the teeth clean and white a tooth powder made by some reputable dentist must be called into use. I make all my own powders and washes, and have them used every day, morning being most desirable. It is most essential that the mouth be thoroughly cleansed at night before retiring, as then the most harm is done, for during rest and sleep the mouth is in repose, and when awake the action of the saliva on the teeth acts as a cleanser, and does not have the same action upon the teeth as when quiet.

My experience has all been practical, and whenever I have an idea I reason it out and find out *why* I am to do such and such, and remove the cause to remove the disease. Ofttimes decay comes from the condition of the stomach. When I find such to be the case I start in a course of treatment, prescribing lime water, mouth washes of bicarbonate of soda and others to neutralize the acid. If decay comes from other bad teeth in the mouth I advocate immediate filling of the offensive members. I reason thusly, although not an elegant comparison still a true

one : Take a bin of apples ; if one decays, in due time the whole bin will become affected. So with the teeth ; remove the cause and you will remove the trouble. Hence my strong advocating that cleanliness is next to godliness, and a sure preventive to decay.

How Contagion Is Transmitted, and the Agency of Bad Plumbing and Badly Built Sewers.

BY C. A. LINDSLEY, M.D.,

Secretary of the State Board of Health of Connecticut.



HEN a person receives the contagion of any disease from another sick with it, it is not always necessary that the recipient should have touched the sick person. Scarlet fever and diphtheria are often communicated to others who do not approach the sick, but are only in the same room. In such cases the medium of communication is the atmosphere about the patient, which is charged with the contagion. In this way the visiting party gets the disease from "a previous case."

But that is not the only way in which it can be given. The "previous case" may be a fatal one, may die and be buried. Now, if the clothing of that patient be packed in a trunk and shut up from light and air, and if it be subsequently opened weeks, months or even years afterward, and if the clothing be taken out of the trunk and shaken in the presence of a susceptible person, he will take the disease, although "the previous case" may have been dead and buried before the one who gets the contagion from his clothing was born. Here the medium of contagion between the "previous case" and the present one was the infected clothing. It illustrates the prime importance of complete disinfection of *everything* which may have been infected by such patients. It illustrates also the remarkable vitality of these disease germs.

Under favorable conditions disease-producing germs can be cultivated. So it is believed that the germs thrown off from the bodies of diphtheria and scarlet fever patients may find favorable conditions for their reproduction, may find a soil adapted to their

perpetuation. There is no end of proof that there are many things besides the clothing worn by such patients which are capable of holding the infection in an active state for a long period. The many instances in which diphtheria is associated with filthy surroundings, with imperfect plumbing of houses, and the numerous outbreaks of diphtheria promptly after the opening and removal of the contents of cesspools, give strength to the belief that sewage may be a good culture medium for the perpetuation of the germs if at any time the infection from a "previous case" may have been implanted in it.

There is another way in which bad plumbing and badly built sewers may contribute to the spread of these and other infections. Leaky sewers contaminate the soil, and bad plumbing admits sewer gases into the houses, which may carry with them microorganisms. Persons exposed to these conditions are known to be far more susceptible to disease—that is, more liable to take contagious diseases and less able to survive them than others. Hence when infectious diseases prevail, they find many more victims and a larger proportion of fatal cases in such circumstances than where the air is pure and the ground is clean. In short, the "previous case" can be the source of the disease for a long time and in many different ways unless disinfection has been complete.

Small Parks.¹



RECENT sanitary progress has directed marked attention to the want of an abundant air supply in the densely-peopled districts of American no less than of European cities. This want is an effectual agent in increasing the virulence of epidemics. It is also a constant cause of poor health, of susceptibility to disease, and of inability to recover from ailments of any description. This broad fact is demonstrated all the time in the daily practice of medicine. Recently the prevalence of cholera in cities like Hamburg has brought it into great prominence.

From the great attention given the subject of public parks since the beginning of the present century, one would not suppose this great sanitary defect still so prominent. All large cities have,

¹ From the Tennessee State Board of Health Bulletin.

especially within the last fifty years, expended vast sums of money in purchasing land by the hundreds of acres, and in adorning the same in the most elaborate manner as popular resorts, and as lungs for the city. New York, Chicago, Baltimore and Philadelphia furnish examples of this fact on a most extensive scale.

Now, experience shows that these vast artificial parks necessarily on one side of a city, even when named Central, do not accomplish either their purpose as lungs for the city, or as places where the great masses of working people with their families can enjoy the beauties of a magnificent Nature.

Go to New York, for example, and what do we see around its splendid Central Park, purchased, ornamented and sustained by the taxes of all its inhabitants? Not the dwellings of the working people, but the palatial residences of the wealthy who, also, in the hot summer months, leave the city and go to the seaside or the mountains. The people who least need the country advantages of Central Park are the very class who get these advantages, and virtually throw them away.

Even on Sundays and holidays only those in comparatively comfortable circumstances can afford to visit this great show ground with their wives and children. Street-car fares effectually preclude this. On Sundays what do we see at Central Park? A long procession of carriages, filled with the rich, and drawn by the finest of horses, a rare spectacle for the thousands of shop keepers who come to gaze; or else for the comparatively small number of laboring people who live in the neighborhood.

No one who has not made a study of Hyde Park, the Bois de Boulogne, etc., can realize how very little these volunteer resorts add to the air supply of London and Paris, and how almost exclusively they are mere appendages to the fashionable and non-productive world.

In all these cities sunshine and pure, fresh air—Heaven's free gifts—are rarely enjoyed by thousands and thousands, while, also, the great majority of children grow up in absolute ignorance of the beautiful world so near and yet so remote, and about which they read so much in the public schools, where a large part of each day is spent.

An able writer, in the October number of the *Popular Science Monthly*, states, that "of a class of about thirty girls, from 8 to 13 years of age, living east of the Bowery, only three had been

in Central Park, and only four had ever visited the country." This fact is only an index, a pointer. What a commentary upon the boasted progress of municipal comfort in the greatest of American cities. The gross defects of this state of things have not escaped the attention of sanitarians and educators. Recently an effort has been made in Boston for establishing small parks, so as to benefit the masses. Perhaps the most persistent worker in this field is Charles Frederick Wingate, eminent as a writer and journalist, and by profession a sanitary engineer. He has paid special attention to the problem of working men's homes in cities, on which he has written voluminously in the New York daily press. In 1887 he was instrumental in securing the passage of a bill to amend the tenement house law and the small parks' bill. In a very few years hence New York and our other vast cities will be adorned with numerous miniature parks in convenient walking distance of its crowded population. For no other result of that public-health movement which has given the name of "Sanitary Era" to our own time is more marked than is the attention now directed to the wants of the masses in overcrowded cities and towns.

We have in Tennessee four cities already of note, and which, in a few decades, will be populous centres. The rulers and the thoughtful people in these cities should at once take hold of this topic and place them far in the advance by providing numerous small parks which shall truly be lungs to the city and convenient resorts for all the citizens. This can now be done. In a few years it will be impossible, for the spaces which should be parks will be occupied by costly buildings.

City rulers should be aware of the coming criterion by which they will be judged. Mere population will not give a city fame. Healthfulness is the first and indispensable requisite. Not numbers, but a low death rate, which signifies a high health rate.

Sanitary Progress.

The only way one can make any real progress in public health (says *The Sanitary Inspector*) is to present again and again those hygienic truths that should be appreciated by the people. "Precept upon precept, line upon line, here a little and there a little," must be the guiding motto. This is an all-sufficient apology for much of iteration—for throwing on the same subject now this light, now that.

Notes on the Communication of Disease.¹

BY WILLIAM THOMAS CORLETT, M.D., F.R.C.P., LOND.

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THOSE MOST FREQUENTLY CONTRACTED IN PUBLIC PLACES.



OF all diseases those arising from parasites or micro-organisms are most frequently communicated in public places. Representative of the animal parasites is the *pediculus*, which possesses the instinct of migration, in common with some of the higher orders of life. It is in the caput covering of children that it finds the widest range for gratifying this desire to find "plains whose verdure no foot hath pressed." The changing of hats so common among school-children, the hanging of coats on the same hook, enables the parasite to travel from one garment to another, and in this way the disease pediculosis is communicated.

The *acarus scabiei* is the presiding genius over scabies, and may be transmitted by shaking hands, from clothing and from towels. It is a common disease among school-children, although no age is exempted. In the adult it is frequently contracted from hotel beds and from sleeping cars; the latter, especially, offers accommodations unsurpassed for their transportation.

The vegetable parasites also are communicable, and of these the *trichophyton* is the most common. This parasite gives rise to three diseases, spoken of collectively as trichophytosis. The first, encountered on the scalp of children, is called tinea tonsurans, is highly contagious and spreads by means of pillows, hair brushes, hats, etc. On account of its persistency it may remain a source of danger for years. Tinea circinata occurs on the body, and is communicated as is the preceding disease. The third variety is called tinea sycosis, and attacks the bearded face of men. This form is usually contracted in a barber shop.

But of more importance than these is syphilis. Not necessarily a venereal disease, for the various modes of inoculation and the facility with which the virus is transmitted renders every person affected a focus of contagion. So widespread is the dis-

¹ Abstract of paper read at the Twentieth Annual Meeting of the American Public Health Association at the City of Mexico, December 1, 1892.

ease, that it is a subject of the gravest importance to boards of public health; so detrimental in its results that ignorance or carelessness on the part of those to whom the public applies for aid, should be considered a crime. Syphilis is frequently communicated in glass-blowing establishments. Drinking vessels are likewise a frequent source of contagion, and it is a question whether public drinking fountains are an unmixed good. I believe they are a source of danger. Public towels, whether in washrooms of hotels, in cars or in factories, may be the means of transmitting syphilitic virus. Combs and brushes used by the public should be regarded with equal suspicion. Of public baths those resorted to by syphilitics are especially to be avoided. Turkish baths are liable to become contaminated, because many physicians advise them in the treatment of syphilis. Syphilis among attendants and table waiters is a very common disease. Their roving and irregular life subjects them to exposure, while treatment, among them, is seldom continued sufficiently long to effect a cure.

Since the discovery of Koch, the *tubercle bacillus* has become a definite entity. Its subsequent cultivation has demonstrated that to this bacillus are due diseases hitherto regarded as distinct and dependent on various etiological factors. This discovery was foreshadowed by histologists when they pointed out the similarity in histological structure between lupus of the skin and tuberculosis of the lungs. But preventive medicine could do little; how little was not really known until these diseases were demonstrated to arise from a *materies morbi* outside the organism, the *bacillus tuberculosis*, and lupus and phthisis were relegated from the idiopathic to the specific contagious diseases. The *tubercle bacillus* attacks different structures according to the age of the individual. Thus in childhood the coverings of the brain and spinal cord are most frequently involved, giving rise to cerebro-spinal meningitis. Later, between the ages of 8 and 20, the skin offers the point of least resistance and lupus is the result. Still later in life, and mainly during the next decade, the pulmonary tract succumbs to this potent destroyer in the form of phthisis. The environment necessary to keep the bacillus alive is seldom absent in humid climates, and already sufficient clinical proof exists that the tubercle bacillus may be inoculated from one person to another, and, according to the structure, one of the forms of tuberculosis above mentioned will ensue. The greatest danger exists in sleep-

ing cars and in hotels. The expectoration of tuberculous matter is profuse and constant; the sputum dries, is carried by the wind, is inhaled or swallowed, or finds a nidus on the abraded skin. In the United States, during the winter months, thousands of unfortunate invalids, coughing, expectorating, flock to the health resorts of the south and west. Railroads vie with each other in soliciting their patronage; hotels scatter broadcast seductive reports setting forth their natural and special inducements to seekers of health and pleasure. Is it necessary to comment on the sequel? Is it not enough to say that from the moment they enter the elegantly upholstered Pullman to the time when they set out on that long journey from whose bourne no traveler returns, they are sowing the germs of disease? That in cars and in hotels the delicate or susceptible are thus brought directly in contact with the afflicted, with the very germs they are least liable to resist. That the strong are exposed in the same way to an infectious disease that carries off in the United States alone one hundred thousand annually, and is far more deadly to the race than leprosy or cholera. Estimating three years as the average life of the consumptive, there are to-day in the United States 300,000 active agents spreading the disease.

How prevent these evils that menace the human race? How fetter this monster ycleped disease? These are questions that this Association should consider.

In brief, then, the knowledge that they exist is of the first importance. Cleanliness comes next. Not the indifferent show of cleanliness the table waiter and the car porter so often exhibit, but that thorough cleanliness prompted by the understanding, which approaches the nearest to godliness. Boards of health should establish regulations against the spread of syphilis and tuberculosis as strongly as against smallpox and cholera. Further, there should be a careful inspection of dwellings, public buildings and conveyances, and a thorough disinfection of the same after harboring or carrying contagious or infectious diseases. These measures can only be carried out by the concentration of power, by the creation in every country of a National Board of Health, to which the boards already existing in many of the States shall contribute to form one comprehensive whole. In the meantime, the public should be enlightened, and in so doing the most powerful means of prevention will be attained.

Wakefulness in Children.¹

BY JOSEPH COLLINS, M.D.,

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and Hospital.

INSOMNIA in children always indicates that there is trouble with some of the functions of the body, and it deserves careful looking after. It has been shown that sleep is attended with a diminution of the amount of blood in the brain, so, conversely, anything that will increase the amount of blood will produce wakefulness. In older people this is most often brought about by worry and care; but these factors are not operative in childhood unless the child be of sufficient age to attend school, when frequently over-study, combined with the pernicious habit of crowding and cramming for examinations, may prevent peaceful and careful sleep. Exercise is just as potent a factor in increasing the power and capabilities of the mind as it is in the body, and no one will gainsay the beneficial results from such labor in moderation; but so soon as the immature brain of the child becomes in the slightest way overtaxed, a continuance of the mental exercise does harm, and may result in something much more serious than simple insomnia.

INDIGESTION.

The next most frequent cause of wakefulness in children is the presence of some irritation in the digestive tract, and, after this, the presence of anything that will cause fever. Thus we see very frequently the delicate organism of young children made the receptacle of malarial poison; and as this produces its exacerbations in the shape of fever, we have insomnia and distressed sleep as the result. Children who are allowed to eat solid food in considerable quantity shortly before retiring are apt to be troubled with restless and imperfect sleep, for the reason that during digestion of these substances a larger amount of blood is required in the digestive organs; and as the heart cannot exercise a selective action and send blood to the stomach alone, the brain likewise receives an extra quantity of blood, and this keeps the little patient from sleeping. It is in this way or in a more direct

¹ From The Mother's Nursery Guide.

manner that the circulation is increased by the taking of tea or coffee, or of stimulants, thus causing wakefulness. These last-named should always be prohibited to children, not alone because they cause wakefulness, but on account of their deleterious action on the nervous system generally.

UNCOMFORTABLE POSITION.

We spoke in a previous article about the position of the body which is most conducive to sleep. It might here be mentioned that when children are put to sleep while in the nurse's arms and then put in the cradle, the difference in the two positions is sufficient to disturb slumber, the head being in one case high and in the other low. It is better as a matter of habit to accustom children to go asleep while lying in the crib; then they are reconciled to their surroundings, and if they awaken they will not cry out or be alarmed.

Mothers have it within their power to prevent sleeplessness in children in almost every case excepting where they are kept awake from pain or severe disease. If the causes that have already been spoken of are prevented, much of the difficulty in this direction will be overcome. There are many little ruses which may be resorted to and which are effective in contributing to the quiet and general comfort which are the forerunners of normal sleep. The most common method adopted for bringing this state about is by the lullaby. No one will have the temerity to suggest that the lullaby owes its magic potency to any artistic method in which it is rendered. As a matter of fact, the greater its monotonousness and the simpler its cadence the greater its efficacy. It acts by producing a weariness of the nerves of hearing, and at the same time prevents the child's little brain from receiving and entertaining stimuli through other pathways, drowning the others, as it were.

SOOTHING INFLUENCES.

There are many other little knacks which are frequently of service, and the possession of them by a nurse is invaluable. We see every day that some nurses have a soothing, beneficent action on children, while others, who are apparently as careful in every way, have just the opposite effect. A child can frequently be put to sleep by quietly stroking the forehead just over the eyebrows, or by employing any other simple means to distract

its attention. Children who habitually suffer from cold feet, this in turn causing sleeplessness, may be made to sleep nicely by giving them a hot footbath before retiring. Of course, the very fact that children suffer from cold feet habitually indicates that in nine-tenths of the cases there is something radically wrong with their digestive tract, and this should be sought for and corrected. To prevent the night terrors and sleeplessness due to injudicious feeding shortly before retiring, nothing is necessary but the removal of the cause, and the symptom will disappear by itself.

It is not uncommon for mothers to allow their children to go to sleep while nursing; and it is one of the commonest practices, particularly among the lower classes, to put the child to the breast whenever it cries. This, of course, is an error, for the little one may be creating the outward disturbance as the expression of an inward one, the result of indigestion, and additional nursing is but simply adding fuel to the flame. Then, again, many children early contract the habit of going to sleep with the finger in the mouth. This is repulsive, both from an æsthetic and hygienic point of view, and should be prevented from the very start. The continual sucking of the finger will in itself be sufficient to set up a condition of wasting and ill-health, not to speak of the disturbances of sleep and dangers of taking noxious substances into the system. Not infrequently it becomes rather difficult to break the habit, and different methods will have to be tried; covering the offending fingers with some very bitter substance, like a mild solution of quinine, made to adhere to the finger by the previous application of glycerine, will soon make the little patient think less of its pastime and stop it.

The disturbed slumber which accompanies the presence of worms in the lower alimentary canal is attended most commonly with grinding of the teeth and picking at the nose and mouth while asleep, frequent turning and changing of the position in bed, and not infrequently a sort of nightmare. The disturbance of sleep arising from constipation is of a mild form; the drowsiness and unrest manifested by the apathy and dulness of the child in the morning are the most common after-effects. This can be entirely overcome by giving a small quantity of a rhubarb-and-soda mixture on retiring, and by making the child take plenty of exercise in the open air during the day.

Speaking of out-door exercise, it is well to emphasize this

point. We all know what a drowsy feeling comes over us if we remain long in the open air, especially if the day be cold. This feeling of languor and desire for sleep is not so apparent while in the air, so long as it is not excessively cold, but it comes on immediately when we go to a warmer atmosphere. Therefore, when we combine with this out-door life a goodly amount of exercise, that is sufficient to produce tiredness without extreme fatigue, it will have a most salutary influence upon the child's rest.

In weakly, irritable and nervous children who are bad sleepers, or who have trouble in going to sleep, there is nothing that acts so much like magic as the external application of warm water, applied as a warm bath or by means of the wet sheet. Warm water acts to produce a powerful and pleasing sedation of the sensory nerves all over the surface of the body. It acts on the sensory nerves in the same manner as does a lullaby on the nerves of hearing. In the case of hearing, however, there are but two nerves, while there are hundreds of sensory nerves; so the application of warm water may be compared in its beneficial results to the simultaneous application of a large number of lullabies.

There is a variety of sleeplessness in children in which the action of cold water, applied by means of cloths dipped in it and then wrung out and applied directly to the head, is beneficial. It is of most use when the insomnia is attended with a full pulse, flushed face, a feeling of heat in the head when the hand is applied, and restlessness. It is a well-known fact that in Thibet mothers place their wakeful children in positions where a small stream of cold water can be made to pour gently upon the head, the children very soon falling into a sound, refreshing sleep.

Regarding the administration of medicines for the relief of sleep and its disorders in children, it may be said that it is only on very rare occasions that such are required; as has before been stated, removal of the cause is sufficient.

SOMNAMBULISM.

Sleep-walking is not a very common condition in children before the second teeth make their appearance. It, however, occurs with considerable frequency after this period. It may be considered a form of disturbance of sleep in which the parts of the brain whose function it is to govern movements are active; the results are that the patient arises and does some act requiring

complicated muscular movements, or walks long distances, or performs some hazardous feat without fully regaining consciousness. Many stories are told of the wonderful feats performed by persons in this condition; and as it is a feature that commends itself forcibly to the romancer, the examples in fiction bid fair to outnumber the actual cases. Its occurrence in children should be carefully investigated, mainly because if it once occurs there is danger of its repetition, with chance of an accident. As a rule, it occurs in young people who are born with a nervous inheritance, and measures must be taken for the removal of this slumbering ember which may at any time burst forth into flame. The same instructions that have been given for the relief of night terrors apply here.

DREAMING.

We can only be sure that dreams occur when we are told of them. It is probable, however, that they do occur in early childhood, and that the flitting of a frown or a smile across a baby's brow is the outward manifestation of the pleasing or pleasurable stimulation. It has been worked out with a great deal of ingenuity that different forms of dreams have different forebodings, but this is, of course, of no moment, and simple dreams without any terrifying or harrowing tendencies do not need special consideration. Like a great many other disturbances of sleep, they may be associated with improper position of the body, overfeeding, want of food and drink, or some disordered condition of the nervous system amenable to the treatment already named. Children should not be encouraged to attempt to relate their dreams, for in this way the thought given to them may be sufficient to give an impulse to their repetition, and a habit of dreaming will soon be acquired.

Mental Dyspepsia.¹

BY J. H. KELLOGG, M.D.



It is doubtless true that very many people read too much. Not that they devote too many hours to the perusal of books and newspapers, but that they endeavor to cover too much space in a given time. While they read, they do not

¹ From Good Health.

“mark, learn and inwardly digest,” but bolt their mental food much as the glutton devours the material provision set before him. They rapidly skim over the matter in hand, gathering, as they think, the salient points thereof, though, in reality, they miss and reject many sweet morsels that lie between the more sensational portions. They are great—indeed, omnivorous—readers, and are always ready to resort to a book or newspaper for recreation, or to “pass away the time,” but rarely, or never, for securing information, except upon the current events of the day. They have “heard of” almost everything; but ask them to impart some definite knowledge concerning some subject, and it will be found that they have only heard of it.

Of real solid ideas they have but few: of glimmerings of ideas, many. They hold in their minds a brief and unsatisfactory epitome of the most important events in the world's history, and some of the arts and sciences; but they would be utterly unfit to teach even a child the story of our own national struggles for freedom and existence, or to tell why the days are long in summer or short in winter. The natural consequence of this irrational mode of reading—or rather, cramming—is mental dyspepsia. The facts and arguments and illustrations that should be stored and retained in the memory, to furnish mental brawn, muscle and blood, are forced through the brain, and leave but little trace behind, save remembrance of an interminable string of words, the power and meaning of which have been lost.

This continued, the mind becomes more and more diseased, and the result is mental marasmus, which, in extreme cases, may end in extinction of the reason.

As dyspepsia is one of the most prevalent of the disorders to which the human frame is subject, so is this mental disorder the most frequent that attacks the human brain. It prevails in all classes of the reading community, though most frequently found among that semi-literary class whose education raises them a little above the ordinary level, while it does not fit them to be leaders among the world's workers and thinkers. They have learned enough to give them a great craving for more, and fancy they are adding to their stock of knowledge by taking into their brain, through the eye, the mere forms of words on the printed page.

As in the physical ailments, so in the mental, the best remedy is temperance, or abstinence, and robust exercise. If one finds himself afflicted with the complaint, he should at once begin a

course of severe discipline. Let him eschew those things that have been most tempting—read the daily newspapers in moderation only, and begin to study whatever he reads. With his eye upon the printed page, let him master every word he sees there, and not trust to the context “to give the sense of it.” Aside from that which may be his special object of study, let him choose the best authors, who will give him well-cooked food, instead of the fantasies of disordered imaginations. A few months’ steady regimen of this sort will afford great relief, and go far toward effecting a permanent cure.

The Physiological Effects of Air Vitiating by Respiration.

Haldane and Smith, in the *Journal of Pathology and Bacteriology*, Vol. 1, No. 2, claim that the view that the evil effects of the air of overcrowded and badly-ventilated apartments are due less to excess of carbonic acid than to the presence of an organic body or bodies given off with it as a respiratory product is erroneous. They consider the experimental evidence in favor of its support as of very doubtful value. The object aimed at in these experiments was to determine the physiological effects of air polluted by *normal* respiration and perspiration. Accidental vitiations arising from want of cleanliness, either in the room or on the part of the persons present, were not taken into account. The following are the chief conclusions at which they arrived:

(1) The immediate danger of breathing air highly vitiated by respiration arises entirely from the excess of carbonic acid and deficiency of oxygen, and not from any special poison.

(2) The hyperpnœa is due to an excess of carbonic acid, and is not appreciably affected by the corresponding deficiency of oxygen. The hyperpnœa begins to appear when the carbonic acid arises to from 3 to 4 cent. At about 10 per cent. there is extreme distress.

(3) Excess of carbonic acid is likewise the cause, or at least one cause, of the frontal headache produced by highly vitiated air, for hyperpnœa from defective oxygen begins to be appreciable when the oxygen in the air breathed has fallen to the point, which seems to differ in different individuals. In the case of one of ourselves (the authors), the hyperpnœa became appreciable at about 12 per cent. and excessive at 6 per cent.

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Theory of Attenuation.

AFTER many experiments Pasteur found that the virulence of the hydrophobic poison is modified in the organism of the rabbit, the guinea pig and the monkey, and that being, so to say, acclimated in these animals, it acquires a special degree of virulence in each of them.

Taking as a standard for purposes of comparison the virulence of the poison from a rabid dog, he found that the rabbit and guinea pig intensify while the monkey lessens the virulence of the poison.

The degree of virulence varies with the length of the period of incubation; the shorter the latter the more active the poison.

If the hydrophobic poison derived from a dog is inoculated under the meninges of a rabbit the animal will die in from fourteen to twenty days. Now, if virus from this rabbit is introduced into another rabbit, and inoculation from the latter made into a third, and so on for a long series, it will be found after about fifty inoculations that the period of inoculation is constant, occupying from six to seven days. It is otherwise in the case of the monkey; after five or six successive inoculations made in the manner just described, the poison produces death in the rabbit in twenty-eight or thirty days; in the dog in sixty days.

From these facts Pasteur concluded that by inoculating first with attenuated virus (attenuated virus is that which kills after a long period of incubation), then with a more active one, an animal may be rendered immune against the poison of rabies.

Experiments have confirmed this hypothesis. Pasteur succeeded in rendering a dog immune by subjecting it to a series of inoculations beginning with the attenuated virus of the monkey and ascending gradually to the more active poison of the rabbit. Somewhat later, Pasteur discovered that to secure attenuation of the poison in its passage through the monkey was not necessary; but it sufficed to dry the spinal cord of a rabbit at a fixed temperature.

The method is as follows: The spinal cord of a rabbit that died from a virus of constant incubation is cut in two pieces and hung in proper bottles in which the air is renewed by passing through a layer of cotton; in the bottom of each bottle some caustic potash is placed. The bottles must be kept at a temperature of 20° to 22° C.

After desiccation lasting seven days the virus is attenuated to such a degree that it will no longer kill rabbits.

The attenuation is acquired gradually, and manifests itself by increasing the period of incubation; after two days no alteration is noticeable; in from three to five days the poison has a period of incubation of eight days; after six days the period is prolonged to the fourteenth day, and after seven days' drying the attenuation is complete.

After having thus found a mode of obtaining a graduated series of attenuated viruses by the inoculation of which animals could be rendered immune, the advisability suggests itself of applying the same method to human beings bitten by rabid dogs, in the hope of conferring immunity against the poison before it has time to act.

The period which intervenes between the bite and appearance of symptoms, and which in man is quite variable, gives an opportunity to apply the method.

If we consider that the system becomes inoculated at the time of the bite, the treatment is essentially curative and not preventive; according to Pasteur it is purely preventive.

Inoculation has the power of protecting the organism against subsequent infection; its application in this sense is out of the question. But Pasteur firmly believes that by his method he is able to protect the system after infection has taken place; that is, after the infliction of the bite.

Pasteur's earlier method consisted in the use of about 1 c.c. of emulsified spinal cord. The inoculation was begun with a

dried cord fourteen days old, and advanced every day until a cord one day old was reached.

The method has undergone numerous modifications; the principle has, however, always remained the same.

A very radical change has been made by Ferran, who takes 10 grammes of brain substance of a rabbit that has just died and makes it into an emulsion of 30 grammes; every patient receives 40 c.c. of such an emulsion.

He asserts that among 187 persons thus treated there was not a single death. This statement, however, must be received with caution.

If it were true, the theory of attenuation would fall to the ground, since in Ferran's method a non-attenuated cord is used. Högyes has successfully employed a similar method of inoculation in the case of the dog.

In 1885 Pasteur for the first time tested his method in man, Joseph Meister, a patient supposed to have been bitten by a rabid dog, being the first one to submit to inoculation; he recovered. From that time until the present inoculations have been employed in many cases.

A Painless Death.

Benjamin Ward Richardson says: "By the strict law of nature, man should die as unconscious of his death as of his birth. . . . This purely painless process, this descent by oblivious trance into oblivion, this natural physical death, is the true euthanasia; and it is the duty of those we call physicians to secure for man such good health as shall bear him in activity and happiness onward in his course to this goal. For euthanasia, though it be open to every one born of every race, is not to be had by any, save through obedience to those laws which it is the mission of the physician to learn, to teach, and to enforce. Euthanasia is the sequel of health, the happy death engrafted on the perfect life.

"When the physician has taught the world how this benign process of nature may be secured, and the world has accepted the lesson, death itself will be practically banished; it will be divested equally of fear, of sorrow, of suffering. It will come as a sleep."



The Berlin Sewage Farms.

At a recent discussion on sewage farms and typhoid fever at the Medical Society of Berlin, Professor Virchow expressed the opinion that the sewage farms of Berlin cannot be regarded as in any way tending to spread typhoid fever, and stated that no single case of it had been traced to the drinking of the effluent water.

Dyspepsia and Beef Tallow.

Dr. Park Holland, of Hyattville, Wyo., writes: "I have found that in any gastric trouble accompanied by the eructation of gas—sour or otherwise—a liberal use of beef tallow to the exclusion of all pork fat (lard) is an excellent remedy. Beef tallow is rendered the same as lard—salt added, after skimming. This will keep it sweet and wholesome in the warmest weather. Use this in the kitchen, in place of lard. A person who is inordinately fond of 'grease' can saturate his food in this with no resulting 'belching.' I treat the alternating diarrhoea and constipation in the ordinary way, peculiar to each case, and find I save the patient much time and distress."

Mortality of New York City in 1892.

During the year 1892 there were reported 44,317 deaths, against 33,650 in 1891. Owing to the increase in the population, however, the annual death rate was 24.25 per thousand inhabitants, while in 1891 it was 24.73. During the year the deaths from phthisis were 5,005, and from accidents, 1,571. There were 320 deaths from sun-stroke, while in 1891 there were but 95. The number of reported cases of some of the more prominent contagious and infectious diseases was as follows: Scarlet fever, 6,947; diphtheria, 4,636; measles, 12,694; typhoid fever, 1,129; typhus fever, 206; smallpox, 367; cholera, 10. During the year the officials of the Board of Health vaccinated 142,050 persons, and seized and destroyed 5,128,614 pounds of food unfit for use. There were reported 49,437 births, as against 46,904 in 1891.

Removing Odors from the Hands.

A paste of ground mustard and water is a first-rate agent for removing traces of disagreeable smelling substances from the hands, such as salts of valerianic acid, cod-liver oil, etc. Huber claims that any oily seeds when powdered will answer this purpose. The smell of carbolic acid may be removed by rubbing with dampened flaxseed meal.—*The Registered Pharmacist.*

Swiss Railway Hygiene.

From *The Sanitary Inspector* we learn that the Swiss regulations, promulgated August 15, 1892, against the danger from cholera, prescribe that the closets in railway carriages shall not discharge upon the ground, but shall be provided with a receiver securely attached to the lower end of the soil pipe, or by the removal of a portion of the pipe and the fixing of a vessel directly below the seat. Whatever form of catch basin is used each must receive at least two quarts of milk of lime just before the train starts, and when the destination of the car is reached there shall be poured into each vessel a quantity of milk of lime equal to the quantity of its contents. After the vessels are emptied, they are to be abundantly rinsed outside and inside with the milk of lime.

Period of Incubation of Chicken-Pox.

Dr. John J. Eyre writes to the *British Medical Journal* that on November 18, Mrs. M., residing at Hampstead, accompanied by her little boy, visited a married sister living at Streatham. They stayed at Mrs. O.'s house about three hours. Soon after they left Mrs. O. found that one of her children had red pimples on the body. The doctor who saw the child next day discovered that she was suffering from chicken-pox. Mrs. M.'s child was taken ill with the disease on December 2, and the rash appeared on December 3. The writer regards the case, though it is an isolated one, as worthy of record, because, first, it enables us to definitely declare the period of incubation to be fourteen days; and, secondly, it proves that chicken-pox is infectious directly the rash appears.

Unaccountable Drowning.

We find in the *Northwestern Lancet* a more reasonable explanation, supported by facts, of the sudden drowning of good swimmers, hitherto attributed to cramps. There is nothing in a cramp in a leg to prevent an ordinary swimmer supporting himself in the water by his hands, or on his back, nor to cause him to throw up his hands and sink once for all like a stone. The cause is attributed to perforation of the ear drum, through which the excess of water pressure occasions vertigo and unconsciousness; and a practical caution results, to persons having such perforations, to protect their ears with a stopper of cotton when bathing.

The Pianoforte as a Focus of Infection.

The sources of infection in this civilized age are as numerous as they are varied, and meet us at every turn. The *Musical Times*, in one of its recent issues, calls attention to one of these sources of trouble, and one which is very apt to be overlooked. A well-to-do household is extremely likely to include among its members a devotee of one of the "tuneful nine." The probable presence of musical instruments in such a family cannot be regarded as a very violent assumption, and in the list of such distributors of harmony the pianoforte will very likely take a prominent place. Yet the result of the fondness for sweet sounds may perchance be the introduction into the home of an element of discord much more displeasing than that which strikes the sensitive ear, since it may affect the harmonious working of the whole economy. How this diaster may arise is set forth with more or less cogency by our contemporary aforesaid. He puts the matter in this way. A garment exposed to infection can, he says, "be quickly disinfected, but it is far more difficult to fumigate all the multitudinous cloths, baizes, felts and woollen materials which the complex mechanism of a piano contains. It is questionable, indeed, whether this is ever properly done. Few pianos are regularly cleaned out. Dust accumulates in them, and they become a receptacle for all kinds of dangerous germs. Among musicians it is well known that one of the chief centres in Germany of cheap piano-making is Hamburg; and—especially in the slums of St. Pauli, where the cholera has been rife—thousands of pianos are in course of construction, the majority of which are destined for the English market."—*Lancet*.

Health of the Mind.

Miss Alcott used to relate the following concerning Emerson: "When his library was burning in Concord, I went to him, as he stood with the firelight on his strong, sweet face, and endeavored to express my sympathy for the loss of his most valued possessions; but he answered cheerily: 'Never mind, Louisa; see what a beautiful blaze they make! We will enjoy that now.' The lesson was never forgotten; and in the varied losses that have come to me, I have learned to look for something beautiful and bright."

The American Girl as She Sometimes Is.

This young compatriot of ours no longer laces herself to breathlessness and a red nose and a pimpled forehead, pushing what flesh there is into regions where it makes deformity; she wears corsets, but only to outline and partially support, never to press or pinch, and thus her digestive organs are kept free to do their work and assist in preparing the rounded and velvety surface, the glow in the eye, the blush upon the cheek, the dye of the soft lips; for, unpoetical as it appears, the laboratory of beauty is in the stomach. In addition to all this, the American girl is no longer ashamed of her foot. She used to think it a disgrace if she wore a larger shoe or boot than a No. 2½; if she wore fours she managed them; if she wore fives she hid her foot. Now she understands that it is a law of statuesque beauty that a body should have an extremity apparently equal to its support—a woman a foot big enough to stand on, and *bien chaussée, bien gantée*, she never dreams of lengthening her skirt because her shoe is a six or seven, or of keeping her hands out of sight because they did not stop growing when she was ten years old. Owing to this last act of wisdom she can walk with freedom where she will, without pinched feet or any of the discomfort that urges her to sit still; and thus she takes with delight the exercise which does so much for her, which fills her lungs with fresh air and oxygenates her blood, and gives it all its life and sparkle wherever its effects are visible. After all, it is common sense, the appreciation that nature says how much to eat and what to wear, that has reformed an ailing and early withered woman into a beauty of the old Greek type.—*Harper's Bazar*.

Disinfection of Cabs.

This is a subject which has received surprisingly little attention compared to its importance. Typhoid fever patients, patients sick with diphtheria, pneumonia, and other infectious diseases, are not infrequently transported from hotels and boarding houses to State hospitals, especially in the large cities, and sometimes are carried from railway trains to their homes, or the reverse. It requires no argument to emphasize the danger to which well persons are exposed in riding in hacks after they have been used for the conveyance of persons suffering from infectious disorders. It is certainly important that city ordinances should exist requiring the thorough disinfection of all public conveyances, whether hack, omnibus, or railway car, which have been used in transporting persons suffering from an infectious disease.

Insanitary Houses.

A case heard on June 18th by Mr. Justice Grantham and a jury contains a point of interest to house owners which deserves notice. A tenant sued his landlord for expenses incurred in the cure of the former's children during an illness which is reported to have begun with a sore throat, "giving way" to scarlet fever and being followed by diphtheria. It was alleged that the drainage of the house was faulty, but that the defendant had clearly stated before the house was taken that it was in a good state. The representation, if there was one, was verbal, but this was held to be sufficient, and the jury were satisfied that the illness was caused by the condition of the house. A verdict, therefore, for the plaintiff, with £60 damages, was given by the jury. The grounds for assuming that any particular illness is due to a local condition of this sort are not very certain and juries are, perhaps, as a rule, not especially well qualified to determine so complex a question. We would gladly see cases such as this referred to a capable health officer, who would be far better able to examine the evidence and arrive at a correct conclusion. In the present case, if the warranty was given the tenant deserved compensation for having been induced to take a house which was in an unwholesome condition, whether the illness was caused by the condition of the house or not.—*The Lancet*.

The Centre of Population.

1790—22	miles east of Baltimore.
1800—18	“ west of Baltimore.
1810—40	“ northwest of Washington.
1820—16	“ north of Woodstock, Va.
1830—19	“ west of Moorefield, W. Va.
1840—16	“ west of Clarksburg, W. Va.
1850—23	“ southeast of Parkersburg, W. Va.
1860—20	“ south of Chillicothe, O.
1870—48	“ east of Cincinnati, O.
1880—8	“ southwest of Cincinnati, O.
1890—50	“ west of Cincinnati, O.

The centre of population moves almost directly westward about 50 miles each 10 years.—*U. S. Census.*

Syphilis and Athletics.

The army and navy doctors who took part in a recent discussion on athletics, at the London Medical Society, took a very despondent view of the effects of syphilis in promoting physical breakdown under a strain. One gentleman laid it down as an axiom that men who had suffered from syphilis should at once and forever abjure athletic pursuits. Another speaker considered that secondary syphilis was a *primâ facie* reason for invaliding the soldiers' home (*The Hospital Gazette*). Fortunately, Mr. Jonathan Hutchinson does not take so gloomy a view, and as he speaks with a possibly unrivalled experience of the disease, his dictum is reassuring to the unfortunate victims. It cannot be denied that the course of the disease is sometimes associated with a very marked depreciation of muscular energy, but this may be due in part to the moral effect, and Mr. Hutchinson asserts that in many instances the condition is directly due to the depressing influence of the prolonged ingestion of iodide of potassium. With regard to the influence of physical exertion in causing structural and functional heart trouble, the speakers were agreed that it is the repetition of the strain that is so injurious, especially when it takes the form of racing against time. Of sports, rowing would appear to be the least dangerous, while running and cycling are fertile sources of cardiac hypertrophy and tachycardia.

Fighting Mice with Bacilli.

Prof. Loeffler's bacillary crusade against the field mice of the Thessalian plain has ended in victory. It will be remembered that Prof. Loeffler some time ago discovered a new bacillus, the "bacillus typhus murium," which has the power of producing a certain disease in mice, and in mice alone. A plague of field mice threatening to destroy the harvest, having appeared in Thessaly, he was appealed to by the Greek government, and immediately started for Athens. He began his experiments by treating field mice in the laboratory with injections of his bacillus cultivation, and when these experiments showed his method to be undoubtedly the right one, he started for Thessaly with a staff of Greek doctors. Bread crumbs, saturated with the bacillary substance, were strewn broadcast over certain fields, and as early as a week later the results were visible.—*Physician and Surgeon.*

A Great Remedy.

The *London Telegraph* tells of an amusing scene which was witnessed one day on one of the channel boats between Calais and Dover. The sea was rather rough. A young woman, pretty and nicely dressed, appeared to be suddenly taken very ill with sea-sickness. She groaned and screamed in apparent agony for some little time. At length a gentleman, who appeared to be a stranger to her, approached her, and asked whether she would like to take a lozenge, which he guaranteed would ease her of her pain. He had often tried it, he said, on people, and always with the most marvellous results. The young lady demurred a little at first, but finally accepted the offer. Never was cure so instantaneous. Hardly had she swallowed the lozenge when the fair patient was sitting up all smiles and ordering ham sandwiches and bottled ale of the steward. Some passengers were so struck with the incident that they inquired what was the remedy that had such a wonderful result, and the gentleman, who, as he said, was the agent for the sale of the lozenges, disposed of a considerable number of boxes of them at ten francs apiece. What was the surprise of the purchasers when they saw the young lady and her preserver go off arm in arm when the vessel reached Dover. The boxes were boxes of common jujubes.—*Medical Record.*

Cancer not Increasing.

At a recent meeting of the Royal Society, Mr. George King, F.I.A., and Dr. Arthur Newsholme, read a paper on "The Alleged Increase of Cancer," in which they supported the old opinion that the supposed increase in cancer is only apparent, and is due to improvement in diagnosis and more careful certification of the causes of death. Their arguments are founded on a comparison of the official cancer death rates for England and Wales, Scotland, and Ireland, with other data obtained from the experience of the Scottish Widows' Fund and the official cancer returns of Frankfort-on-the-Main.

Raw Beef Steaks.

Popoff's researches on the digestibility of beef and fish, prepared upon different methods, show very conclusively that both these comestibles are much more digestible in their raw state than when cooked. According to his observations, the longer the beef is cooked the more indigestible it becomes, and contrary to generally prevalent ideas beef is in all cases more digestible than fish, except in case of smoked beef. The superior digestibility of raw meat has long been recognized by physicians in the feeding to invalids with weak digestion meat pulp, beef juice, and other preparations of raw meat. The question now arises, shall the cooking of meat be abandoned?

In the light of these physiological researches it would seem that the cooking of meat is an ancient error into which the human family have fallen, and that if we are to use flesh as an article of food we ought to return to the primitive habit of eating it raw, like a native of Terra del Fuego, or a Kalmuck Tartar. The danger of contamination by disease germs or infection by trichinæ, the embryos of tapeworm, and other parasites, stares us in the face, however, and hence there seem to be left but two alternatives: either to take our beef steaks as heretofore, well done, or to become vegetarians. Vegetarianism seems to be growing in favor; less, however, through the agitation of the advocates of man's return to his primitive diet than as the result of the constant revelations made by those engaged in pathological and bacteriological researches respecting the numerous evils which arise from the free use of flesh, and the dangers of contamination which threaten meat eaters from a hundred different sources.—J. H. K.

Mosquito Bites.

A Russian physician recommends naphthalin as a remedy for insect bites. The drug is employed in the form of a saturated solution in liquid vaseline, two or three drops being applied to the bite. It causes a smarting sensation, which is, however, only temporary.

Catching Cold.

Colds and acute lung and bronchial troubles are not nearly so much due to our climatic conditions as to our abuse of the means of protection against cold. The abuse is living in unventilated rooms, and heating them to a temperature above 70° F.—often much above. Hunters and trappers in our northern woods rarely “take cold,” and the same is true of Arctic explorers.—*Sanitary Inspector.*

Microbes in Dust.

Dr. Manfredi has made an elaborate investigation of the dust of the streets of Naples. The number of microbes of all kinds he found on the average to be 761,521,000 per gramme. In those portions of the city under the best hygienic conditions, the average number of microbes was only 10,000,000 per gramme. In the busiest thoroughfares the average rose to 1,000,000,000, and in some of the dirtiest streets it rose to 5,000,000,000 per gramme. In this boundless ocean of life he found a large number of the pathogenic organisms, and the unhealthiness of the street was in proportion to the number of microbes in the dust. He tested carefully the infective power of the dust, and obtained positive results in 73 per cent. of the experiments. Of forty-two cases in which he communicated disease to guinea-pigs by inoculating them with the dust of Naples, he found the microbe of pus in eight, the bacillus of malignant œdema in four, the bacillus of tetanus in two, the tubercle bacillus in three, besides several others which had the power of inducing fatal septicæmia in the guinea-pigs on which they were tried.

The dust of our large American cities should now be tested for microbes. There is reason to believe that a harvest as rich in variety and deadliness as was garnered in Naples could easily be secured.

How to Go Summering.

(1) When you go away from home, leave home cares and business anxieties behind you.

(2) Don't act the fop; be a gentleman or a lady wherever you go.

(3) Don't brag about who you are, or what you have done, or what distinguished people you are acquainted with.

(4) However bad any food may be, don't complain of it. If the viands offered you are uneatable, do not eat them. By fasting several days you will become hungry enough to eat an old boot.

(5) When you are at Rome, do as the Romans do. Conform to the manners and customs of the people among whom you are.

(6) Be cheerful, be kind, be considerate. Of course, you have no use for these virtues at home, but when you are abroad they will be useful.

(7) Never interfere with another man's religion, or his wife.

(8) Do not argue with others, and become excited and overheated in hot weather. Let editors, politicians and lawyers, who are paid for it, do this.

Preventive Medicine at Oxford.

Our oldest university has at last awakened to the necessity of taking part in the progress of preventive medicine, and of rendering her degree in public health less exclusively restricted. Following the work of Cambridge, this is now proposed to be open to all registered medical practitioners. A statute embodying this important change will be promulgated before congregation on May 2 next. There is to be an annual examination by four examiners, presided over by the regius professor of medicine. The subjects will comprise: (*a*) general hygiene; (*b*) general pathology, with special references to infectious diseases; (*c*) laws relating to public health; (*d*) sanitary engineering; (*e*) vital statistics. Every candidate must have been registered for a twelvemonth, must have spent six months working in a public health laboratory, and another six months as assistant to a health officer of a town or county of at least 50,000 inhabitants. We trust that the statute will meet with no opposition, and that the Oxford diploma in public health will be eagerly sought after, and confer the same distinction as the other degrees of this university.

—London *Lancet*.

Sanitation and the Communion Table.

The agitation concerning the advisability of doing away with the communion-cup in church services, and substituting therefor individual cups for each member, is bearing fruit. Our friend, Dr. A. J. Longfellow, of Fostoria, O., at the last quarterly conference of the M. E. Church, introduced the following resolution: “*Resolved*, That the church purchase 400 little wine-glasses, and each communicant receive the wine out of a glass that no other person has used, and the bread be passed on baskets or plates, and that it be not handled or broken by the preacher.”—*Cincinnati Lancet Clinic*.

The Goat a Protection Against Cholera.

The most popular place in New York, if the cholera comes, should be Shantytown, and the proudest animal on the island will be the goat. For Dr. Klemperer, of Berlin, after going over the subject of securing immunity against cholera, and after trying all methods of vaccination, including the swallowing of a pint of cholera bouillon, finds that the milk of an immunized goat does the work best and most easily. Subcutaneous injection of the milk from a goat artificially made immune was given to a man (who had volunteered). The injection of 5 c.c. of this milk produced such a degree of immunity that 0.25 c.c. of his blood serum protected a guinea-pig against cholera intoxication. There is hardly any doubt, says Klemperer, that goats may be made more resistant by further injection, and thus their milk will have greater antitoxic properties. The author thinks it permissible to hope that the injection of 1 c.c. of such goat milk will protect men not only against the intoxication of cholera, but also against the infection. The price of goats has been five dollars and upward. When cholera comes this much ridiculed animal may take a position in history higher than the sacred bull of Egypt or the vaccinated calf of Jenner. Harlem, too, will become the centre of New York, and not an uptown annex.—*Medical Record*.

A Gift to McGill University.

Sir Donald Smith has made another gift to McGill University of \$100,000, to endow a chair of pathology and hygiene.

The Church of England Sanitary Association.

At a recent committee meeting of this association in Manchester recently, at which the Archdeacon of London presided, it was resolved that in view of the possible return of cholera, it was desirable that the clergy and ministers of religion generally, having special opportunities throughout the country, should call attention to the duty of every one to concern himself in sanitary matters. It was also resolved to urge the formation of parochial branches which would serve as vigilance sanitary committees.

Bacilli in Butter.

It is generally known that milk affords a dangerous vehicle for the dissemination of disease, but that this undesirable property is shared by butter is information at once of a novel and startling kind, and such as should put us on our guard. Yet, according to recent researches, there were contained in one gramme of butter (as much as would go on the point of a knife) 2,465,555 micro-organisms from the centre of the pat, and as many as 47,250,000 on the outside. In fact, in some cases it is tolerably certain, it is stated, that the number of organisms swallowed with a moderately large piece of bread and butter may excel that of the whole population of Europe. Butter kept in a refrigerator showed a marked reduction in the number of bacteria—a result which is also obtained by the addition of common salt. Samples of artificial butter, curiously enough, were invariably found to be much poorer in bacteria than ordinary butter; thus while the smallest number found in one gramme was 746,059, in real butter considerably over two million microbes was the minimum. Two varieties of bacilli have been isolated and described, and inasmuch as they were found to be constantly present in butter they were probably specific micro-organisms of a non-pathogenic character. But, at any rate, it seems clear that butter as well as milk is capable of carrying and fostering organisms, and on this account it behooves us, under certain circumstances, to melt our butter to boiling point in addition to boiling the milk. We must not, however, forget that nature, which has been so lavish in the production of bacteria, has probably fortified omnivorous man against many bacteriological dangers by the efficient antiseptic of a healthy digestion.

The Bacteriology of Tobacco.

Another article of home consumption has been discovered to be under the sway of the all-pervading germs. Suchsland (*Abst. Centralblatt f. Bact.*, XII, 20) has found that in the process of "sweating," during which many of the aromatic compounds, upon which the flavor of tobacco depends, are formed, the result varies greatly with the kind of bacteria which takes the chief part in this fermentation. German growers of tobacco have tried in vain to improve the quality of their crop by enriching the soil, and by introducing foreign sorts. Suchsland, however, by starting the sweating process with pure cultures of germs obtained from the finer foreign tobaccos, has been able so to influence the flavor of the German weed as to deceive experienced connoisseurs.—*Omaha Clinic*.

The Expectation of Life.

Mr. Stevenson, actuary of Edinburgh, has contributed to the "expectation of life" tables the most recent information on this subject, in the shape of a paper entitled "The Effect of Employment on Life and Health." Many facts are presented concerning the relation of occupation to mortality rates. The largest mortality rate in the in-door occupations considered is found among liquor sellers, a fact which explains the reluctance of life insurance companies to write insurance on that class of risks. Mr. Stevenson finds the average mortality among 1000 liquor dealers to be 29.2, increasing from 12.2 between the ages of 20 and 29 to 102.8 from 70 upward. He divides the liquor sellers into three classes—licensed grocers, hotel keepers and bar keepers—and shows the respective mortality rates to be from 25 years of age upward, 18.9, 26.8 and 33.4 respectively, which shows that the life risk of the average bar keeper is an exceedingly hazardous quantity. Among 1000 gardeners the death rate is found to be 10.6; carpenters, 12.4; shoemakers, 13.4; stonemasons, 16.8; butchers, 17.8; and inn keepers, 21.4. This agrees precisely with the information collected by American life insurance companies, which shows the butcher to be a hazardous risk, second only to the inn keeper and saloon keeper. The most curious facts resulting from this investigation are those concerning the death rate among the clergy, a class which the author has divided into three sections, namely, Church of England clergy, Nonconformist

clergy and Roman Catholic clergy. One thousand cases investigated in each of these sections show the death rate to be lowest in the Church of England clergy, where the average is 10.2, and highest in the Roman Catholic clergy, where the average is 15.7. These figures suggest an interesting contribution to the study of celibacy in its relation to the mortality rate. The value of outdoor exercise, with abundance of fresh air and a clear conscience, is amply set forth in a comprehensive table showing the number, per 100 of the various occupations, that attain the age of 70 or more. Again, the clergy tops the list, with 42 out of 100 who attain the age of 70, while the farmers come next with 40, and the other occupations in the following order: Commercial men (drummers), 35; military men, 33; lawyers, 29; artists, 28; teachers, 27; and physicians, 24. The apparently anomalous feature of these figures is that military men, whose occupation seems to be most hazardous from a layman's point of view, in reality attain a greater longevity than their less warlike brothers of the sciences and arts.

The First Experiment in Inoculation in Russia.

On October 26, 1768, the Empress Catharine II (*vide* a work just published by M. Waliszewski, entitled "Roman d'une Impératrice") submitted to inoculation her own august person, being the pioneer of the practice in her own dominions. At that time this was regarded as an act of heroic self-abnegation, and Voltaire expressed his admiration of the Empress in these terms: "Sa Majesté se laisse inoculer avec moins d'appareil qu'une religieuse ne prend un lavement." The preparations for the novel function were most elaborate, the operator being an Englishman named Dimsdale, summoned expressly from London. M. Waliszewski makes the following comment on these preparations: "On fait moins d'embarras aujourd'hui pour trépanner un homme ou pour lui ouvrir les entrailles." The lymph was supplied by a boy of seven named Markof. This boy was ennobled under the fancy name of Ospiennyi (ospa—smallpox) and brought up under the Empress' own tutelage. His descendants occupy at the present day a prominent position among the Russian aristocracy. Mr. Dimsdale was created a Baron, appointed Councillor of State and Body Physician to Her Majesty, and allotted a pension of £500 per annum.

Coffee Drunkenness.

The idea that tea and coffee are harmless stimulants, or exhilarants, as poetically but untruthfully expressed in the lines of Coleridge: "The cup that cheers but not inebriates," is probably responsible far more than any other for the widespread employment of these drugs, which the physiologist well knows are possessed of an active principle far more potent as an intoxicating agent than is alcohol. Indeed, we have often asserted, and we believe upon good grounds, that a cup of strong tea or coffee is capable of producing a higher degree of intoxication than an equal quantity of lager beer; that is, a smaller number of cups of strong tea or coffee would be required to render a person thoroughly intoxicated than would be required of lager beer.

The following account of coffee drunkenness in South America, from the pen of Fanny B. Ward, we quote from a contemporary journal:

"I have often heard it remarked that there is no drunkenness in Brazil, but the statement is untrue, not, perhaps, so far as alcoholic drinks are concerned, but the whole country is perpetually in a state of semi-intoxication on coffee, men, women and children alike, and to babies in arms it is fed from a spoon. It is a common saying among Brazilians that coffee to be good must be as 'black as night, bitter as death, and hot as hell,' and at all hours of the day and night, in season and out, everybody literally guzzles it—made according to the proverb. The effect is plainly apparent in trembling hands, twitching eyelids, mummy-hued skin, and a chronic state of nervous excitability worse than produced by whisky. Are you overheated in the noonday sun or chilled by the dews of the evening, are you wearied or blue, or suffering from bodily pain or homesickness, coffee is the Brazilian's unfailing panacea, as the Chinese turns to his opium, and the toper to his toddy. It is brought to your bedside the instant you are awake in the morning, and just before you are expected to drop off to sleep at night, at meals and between meals, and whenever a caller comes in—always black as night, bitter as death, and hot as sheol. Connected with each of the theatres is a garden or *café*, to which the people repair between every act to partake of ices, confectionery, wines, and coffee, of course."—*Good Health*.

Cholera from Infected Clothes.

The special correspondent of the *Times*, September 17, gives the following: "In the town of Askhabad the cholera was already nearly extinguished when it suddenly blazed up again with extraordinary violence. On August 3 there were only eleven patients left in the hospital, and they were convalescent; a few soldiers also remained in the same state in barracks. On that night twelve more soldiers were taken violently ill, and within a few hours a fresh outbreak appeared among the townspeople. On the following day 400 were down with cholera. Energetic measures were taken, and the course of the disease was stayed or stayed itself in three days, but during that time 800 persons took it, and about half of them died." It appeared that the soldiers who were first taken ill had gone down to a stream with their soiled linen and had washed it there, drinking also from the same water. The occurrence is very instructive from several points of view; but it certainly shows that the poison can be conveyed by clothes, and as such things can, apart from travelers, be absolutely excluded without any trouble whatever, it is wiser to exclude them.—*Public Health*.

American Childhood.

The disadvantages under which children, especially in our cities, are placed, in being surrounded by artificial, instead of natural, conditions are discussed in a recent paper by Dr. H. L. Taylor. The city children get too little light and air, do not take enough of the right kind of exercise, are often overfed or underfed, or pushed or hampered too much in their studies, and especially in their emotions. There is a precocity in knowledge of people and social relations, darkest ignorance with regard to most natural objects and processes. In diet the city-fed child often fares better than the country one, but in regard to fresh air he is not nearly so fortunate, and as he gets older the difficulty is increased. The city child is hampered in his movements, and at the same time subject to streams of auditory, visual and other impressions in unending succession. His co-ordination is less perfect, although his wits are brighter than those of the country child. The city child loses much in not obtaining an early knowledge of nature. A child to grow up naturally should have a fair share of wholesome neglect and judicious exposure. A

child delights to make himself useful, and it is cruelty to deprive him of this pleasure and stimulus. A boy is better for having a carpenter's bench, and a girl for doing a portion of the housework. The physician is often hampered because his patient has not acquired the art of obedience, or because he cannot tolerate a tongue depressor, or swallow a pill, or be left alone, or sit still, or take in certain classes of facts or ideas. These and similar peculiarities can usually be prevented with a little care or overcome by proper training. They are often the result of carelessness or over-indulgence. Children of the poor in our cities fare better in some respects than those of the well-to-do, owing largely to their greater liberty. The author believes that the physique of children now growing up is not on the whole satisfactory, and that it is a difficult matter to bring up wholesome, hardy children in New York. It is true that the advantages are not all on the side of country life; but in most respects, for children, country life is more favorable.—*Medical and Surgical Journal*.

How Cholera Is Spread.

In the half-yearly report of sickness and mortality among the servants of the East Indian Railway Company, for the first half of the current year, an instructive instance of infection by cholera stools is reported. Dr. Bathe reports that there can be no doubt that milk diluted with impure water was the cause of the outbreak of cholera last April among the European employees and their families stationed at Asansol. The milk supply was not equal to the demand, and the only water available for its dilution was procured by digging holes in the bed of a small river, at a spot where the excreta of several cholera patients had only a day or two previously been thrown. Almost all those who suffered from cholera had partaken of this milk. At Jamalpur a native child, suffering from cholera, was seen by Dr. Brooke lying on a bag full of rice, and the choleraic dejecta were soaking through the gunny bag into the rice. Had this rice been sent on to some distant place where no cholera existed, and had cholera supervened on this rice being distributed and eaten, we might have been treated to various theories as to the origin of the epidemic; but it is very doubtful if the simple explanation of the choleraic dejecta of this child would have been hit on.—*Indian Medical Gazette*.

The Health of Printers Abroad.

Dr. Adolph Vogt, professor of hygiene in the University of Berne, has recently delivered a highly interesting lecture before an audience of compositors at Bâle on the "Hours of Labor and the Diseases in the Printing Trade." All over the world, but particularly in the German-speaking communities, the occupation of the printer takes rank among the unhealthiest. That alcoholism contributes in a special degree to this result is strenuously denied by Professor Vogt, who finds that printers, on the average, are honorably distinguished for the non-abuse of strong drink. Their high death rate he ascribes to lung disease—particularly to pulmonary phthisis. For every 1000 male victims to this malady 72 (according to Professor Vogt) are printers, being about the highest figure reached under this head by any trade. The conditions under which the compositor works, in Germany particularly, could hardly be worse. From the type he handles he contracts what is known abroad as the "intoxication saturnine," which favors a general steatosis of the tissues, resulting in an anæmia, which after a certain stage resists all remedial measures. In addition to this, his hours of work are rarely under eleven out of the twenty-four, and these are spent in an atmosphere in which fresh air is at a minimum, while the noxious elements with which it is charged become trebly injurious under the high temperature almost uniformly maintained. Electric lighting has already done something to mitigate this latter condition, but its introduction will have to become general before it can affect the health statistics of the trade. Professor Vogt advised his German-Swiss audience to bring all influences to bear on a revision of the factory laws as the first step toward improving their sanitary conditions. He further admonished them to agitate by way of petition to the Federal Council and, on the bases of inspectoral reports, to approach their employers in a spirit of amicable remonstrance; but on no account to adopt the violent method of strikes. In the discussion that followed his address there was considerable diversity of opinion, but at its close the sense of the meeting was favorable to Professor Vogt, whose counsels were dictated by a conciliatory spirit in harmony with the interest in the welfare of his audience by which his researches into their case were inspired.

Spring Work for Health in and About the Home, on the Farm, in the Village and City.

Spring is by common consent the season for house cleaning, and for "clearing up" in back yards, front yards and streets; it is also the time for beginning the campaign against ill health, sickness, and premature death, which will "have their best innings" from spring till frost.

Cholera infantum—a specific disease of the bowels in children—will begin its attacks with energy in June, attain an enormous prevalence in July and August, and a very rapid fall in September. The cause of this disease is closely related to filth of soil, foul air and water, in which, with the high temperature of summer, it finds a congenial hot-bed for a prolific and malignant growth. Children are by far the greatest sufferers, and the dreadful fact that this poison finds them in their homes, makes the discovery of its mode of attack and destruction a matter of vital importance to every mother particularly.

Forty-four and nine-tenths per cent. of all deaths in Minnesota in the average of four years are of children under five years of age, and 31.6 per cent. are children under one year of age. What better evidences that the causes of death find them in their homes?

The hot season is the one for rapid growth, maturity, and decay in the vegetable kingdom, to which most of the specific causes of diseases at present known belong. Decay is at this season still more rapid, offensive, and dangerous. In the natural order of things decay is the natural helper of the growth of all forms of vegetable life on the condition that the dead thing is properly buried or burned, a condition difficult to secure in houses and centres of population, just in proportion as they are crowded, and the simple sanitary precautions to be mentioned are neglected.

The sanitary duties in and about the home, from now to winter, may be summed up, from our present standpoint, to be very largely the supply of those conditions whereby dead organic matter may be excluded from the air, breathed in, water drank in, and the house occupied by, every home of our population.

But how? is the natural question. As the mother is the proper *health officer of the home*, what is to follow will be addressed to her, but with the distinct understanding that it concerns the father of the family as well, and that it applies as much to the isolated farmhouse as to the houses of villages and cities,

for the problem is, *How to prevent the occurrence of ill health, sickness, and premature death in the family.*

In beginning anything, it is best to know first what needs to be done, and in this case the first thing is a careful inspection of the house, and everything in it, from top to bottom, with all its belongings, out-buildings, and lot, to find every cause which may foul the air or water supply, or be a breeding place for the germs of disease, or a lodging for preventible nuisance.

Begin with the cellar, which in winter and cool weather is, as a rule, the lungs of the house. It should be light and dry, and all summer long have a free through and through ventilation. See that no decaying vegetable or animal matters are allowed there. Keep potatoes and other vegetables in boxes or barrels small enough to be moved readily. Have no fixtures there, but have closets, milk-safes and the like readily movable, and have them stand away from the walls. It *pays* to have a *cement floor*. If well made it can be thoroughly washed; it helps to keep out moisture, ground air, and vermin, and can be cleaned as readily as stone, and better than wood. Stone or hard brick or cement will do. Soft brick are bad, and wood on the soil very bad—the bare soil is better than that. *Cellar walls* should be coated with *fresh and caustic* milk of lime (true whitewash), *ceilings* to be treated in the same way if practicable, and always kept free from cobwebs and dirt. A *damp and musty odor* should never be tolerated in the cellar air. Keep it sweet and pure for the very simple but important reason that *it determines very largely the character of the air of the house.*

The house itself. All floors should be well jointed, tight, smooth, and, best of all, saturated with boiled linseed oil, or painted; but always by one or the other, but best by the oil, to prevent saturation by offensive matters, which must happen to a floor not so protected. A well-made floor, smooth and well oiled, is so slightly, and easily cleaned and kept clean, that carpets, except as movable rugs, are unnecessary. *The carpet*, as commonly used, cut to the size of the floor, and tacked down for months at a time, always retains filth in and under itself, which the most careful sweeping will not remove. The *rug*, home-made, of carpet, is cheaper, cleaner, healthier, easily aired and dusted, and, fortunately, is now fashionable.

The walls of rooms should be lime washed in simple colors, or painted.

Wall paper and kalsomine are retainers of offensive matter; the cheap glue of the one, and the paste used to put on the other, are very liable to decay. All housekeepers know what a job it is to remove them, which must be done before another application. Arsenic is common in many wall papers, and has caused sickness in such combination; therefore, for health, use lime-wash or paint on room walls. If the last, it should be thin, and a rapid dryer.

As to ceilings they should not be painted or papered. Better lime-wash them. Part of the ventilation of rooms is (if permitted) through the ceiling into the garret, or the space between joists, and thence to the garret.

Closets and clothes presses readily and usually become dry, musty and offensive. The musty odor here and elsewhere in inhabited places is caused by the decay of organic matter. It is due to a vegetable growth, microscopic in size, and for that reason all the more readily floated in the air and breathed. Destroy it by cleanliness, dryness, ventilation, and light.

Winter clothing should be well shaken, and thoroughly aired out of doors, before packing away. Old boots, shoes, and the like should go to the repair shop, to the compost heap, or be buried near the roots of vines or trees.

Bed rooms and bedding. Sleeping rooms are best off the ground floor. For *mattresses* hair leads, of course; next may be put fresh and bright oat straw. For cover nothing equals the *all-wool* blanket, no matter how coarse its texture. The "comforter," *i. e.*, cotton batting as a filling between two layers of cotton cloth is, as usually made, a very poor substitute, a retainer of foul odors, and in case of infectious disease dangerous. It is difficult to wash, and in too many instances is permitted to go unwashed. A better plan for a comforter is to replace the cotton batting with washed and carded wool. Thin, light, tidy, and warm, it is almost the equal of the eider-down quilt. For summer use, light, *all-wool* blankets, with a neat Marseilles or calico spread are best. *Always use sheets* on the bed, as you wear under-clothing on the body.

Beds should be shaken up and exposed to the open air for an hour in the forenoon; windows and blinds open, too, for a free ventilation. Bed rooms for summer use should be uncarpeted, and contain no more furniture than is useful. *Cleanliness, ventilation and sunlight* are even more important here than in other

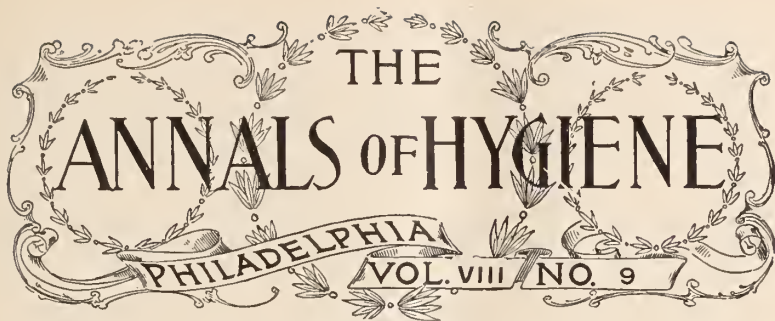
rooms. Iron beds and wire mattresses are nearly as cheap, and much healthier than wood.

The garret should be treated as a closet, through which much of the ventilated air of the house finds its way to the outside; therefore, be sure that it has windows, and is well lighted. Leave its windows wide open the season through. Put in bars if you please; but its free ventilation makes the house cooler in summer, and the air purer in winter.

Cisterns are best made egg-shape, the small end up, cemented inside and out, if of brick or stone. If dug out in solid clay a strong wall of cement as a lining is enough. The egg-shape is not only the strongest, but it collects sediment in a small area of the bottom, and permits room only for manhole and pipes at the top, thus excluding vermin and filth. *Filtration of rain water* is better done before it enters the cistern, if practicable. The difficulty with a filter inside is its cleaning. It may be of brick, filled with charcoal broken up small and free from dust, or better of straw, sand, and gravel, but not under water. It should be well above the bottom, and easily removable for cleaning. *A filter is worse than useless if not frequently cleansed.* The delivery pipe should go within a foot of the bottom, and turn up so that the incoming water may not stir up the sediment. Cisterns should be cleansed after the first spring rain (which washes the roof), and after the fall of the leaves in autumn.

Wells and well water. A "surface water" well is always liable to be soiled by the surface washings from house slops, manure, and the privy vault. The same danger threatens any well from which surface water is not shut out by cemented walls, or better by sealing the pipe in clay or stone, and bringing it up well above the surface of the ground. Artesian, or drilled wells, treated in this way, as a rule (in Minnesota), afford pure and good drinking water.

Sources of impurity to air and water outside the house are, in order of importance, the *privy vault*, *house slops*, *manure piles*, and *garbage*. The first should be cleaned, and its contents taken to cultivated land; then fill up the hole with clean earth, put an earth closet in its place, and determine that never again will you permit that nuisance on your property.—*Public Health in Minnesota.*



THE ANNALS OF HYGIENE

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Lectures on Hygiene.

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LECTURE II.



It has long been proven that air laden with the products of respiration, if very impure, may be not only dangerous to health, but even rapidly fatal to life. Cases that may be adduced as evidence of this are the well-known ones of the steamer "Londonderry," and of the "Black Hole," of Calcutta; also that occurring just after the battle of Austerlitz where, of 300 prisoners crowded in a prison, 260 died within a short time from breathing the poisoned air. But few realize what a depressing effect the habitual breathing of air, only moderately vitiated by respiratory impurities, and those due to imperfect combustion, has upon the health of individuals, or how it predisposes to disease. Those who live in such an atmosphere are almost uniformly pallid and anæmic, subject to headaches, loss of appetite, and nausea, their blood is deficient in red blood corpuscles and hæmoglobin, and they are especially predisposed to such diseases as phthisis, pneumonia, bronchitis, scrofula, rachitis, etc., while, as Wilson says, "all the so-called zymotic diseases are more especially fatal, and spread with greatest virulence in densely-populated and badly-ventilated districts, where also the epidemic diseases are attended with the greatest mortality

and highest sick-rate." Other factors, no doubt, have some influence in producing or favoring these evil effects among people who live under such conditions, but the marked lowering in the mortality from phthisis alone in the British army, as a result of improving the ventilation of barracks, and increasing the room-space of the individual soldier, shows that impure air is probably the most harmful factor of all.

Consequently, as we are not able to practically destroy these impurities as fast as they are produced, we have recourse to ventilation as a means for their dilution and prompt removal. We must not think, however, that we do all that is necessary if we only renew and purify the air within our dwellings; for unless the source and supply from which we take that which is to replace the vitiated air within be pure and clean, any system of ventilation that we may adopt will avail but little. External ventilation of our buildings, streets and cities is of importance, then, as well as that which relates only to the interior of our dwellings, workshops and places of assembly. In fact, numerous investigations and statistics, both here and abroad, show that "the health of a town largely depends upon the width of the streets, the general height of the buildings, and the amount of yard space at the rear of each which separates it from its opposite neighbor," and it is hard to over-estimate the value of wide streets, numerous diagonal ones, and frequent parks or open spaces, especially in the most thickly inhabited portions of a city. In this connection I may refer to an article by Dr. H. B. Anders, of this city, on "Street Width: Its Causal Relation to the Mortality of Phthisis,"¹ in which he shows "that the number of deaths from phthisis on a very wide street is proportionately small compared with almost any one narrow street," and "that there is plainly and generally a high mortality rate from consumption, associated with street narrowness in not a small part of Philadelphia, and that the relation between a high mortality and narrow streets is a positive and vital one."

As regards internal ventilation, it will be well to determine at the outset the meaning and limitations of the term. Parkes says: "It will be desirable to restrict the term ventilation to the removal or dilution, by a supply of pure air, of the pulmonary and cutaneous exhalations of men, and of the products of combustion of lights in ordinary dwellings, to which must be added,

¹ Vide University Medical Magazine, October, 1890.

in hospitals, the additional effluvia which proceed from the persons and discharges of the sick. All other causes of impurity of air ought to be excluded by cleanliness, proper removal of solid and liquid excreta and attention to the conditions surrounding dwellings." With the function of ventilation thus limited it will not be necessary to make provision for such an abundant supply of pure air as might otherwise be necessary. In fact, it is evident that the purity of the air in our dwellings must almost always be relative and not absolute, especially in a climate like ours, which, during the greater part of the year, necessitates the warming of the air before bringing it into contact with our bodies.

What, then, is the least quantity of air permissible and consistent with the requirements of good ventilation and the non-interference with health? To discover this two factors must be determined: (*a*) the extent to which the air of a room is contaminated in a given time by the impurities it receives, and (*b*) the limit of permissible impurity, beyond which there will be a possible risk or detriment to health. In accordance with the above limitations the contaminating substances will usually be comparatively few in number, viz., pulmonary and cutaneous exhalations from individuals, products of combustion from lights and sometimes from heating apparatus, and in sick rooms and hospitals effluvia from the bodies and discharges of the sick. The same rules, however, are to be applied in the case of any other detrimental substance in the atmosphere at any time, provided their source or cause cannot be directly removed.

The most common and usually the most serious vitiation of the air of inhabited apartments is that due to respiration. There is constantly passing off from the lungs and skin of human beings a mixture of carbon dioxide, aqueous vapor and organic matter; of these the carbon dioxide and the aqueous vapor are comparatively harmless, but the organic matter, though present in very small proportions even in air quite foul, is extremely poisonous and detrimental to health. It is probably partly molecular, partly a vapor, it has an offensive odor, is oxidizable and nitrogenous, and, as it is hygroscopic, is probably in combination with water. When concentrated it may produce very acute symptoms and even death, as in the cases noted; when present only in moderate amount it is very depressing and is certainly a causative factor in the production of phthisis and allied maladies. Now, while it is extremely difficult to determine quantitatively the amount of

this organic matter given off from the human body in any given time, numerous experiments have shown that usually the carbon dioxide is given off in a constant ratio with the more harmful organic matter, and can, therefore, be used as a measure or index of the latter. Pettenkofer has accordingly ascertained with considerable care the amount of carbon dioxide exhaled by an individual under varying conditions, and as his results have been substantially confirmed by others they may be taken as practically accurate as far as our present knowledge goes.

His figures lead us to adopt as a general average for a mixed assemblage at rest, 0.6 of a cubic foot of CO_2 per hour per head, and for adult males 0.7 cubic feet per hour, the quantity materially increasing with the amount of work done. These figures, it will be understood, are simply determined as the measure of a proportionate quantity of organic matter given off in the same period of time under like conditions.

In establishing the limit of permissible impurity it will naturally be advisable to require that the supply of air from without shall be sufficient not only to be thoroughly consistent with health, but that there may be no perception of impurity by the senses, the air of the room being apparently as fresh and pure as that out-of-doors. To this end Dr. de Chaumont made a large number of observations (over 450), noting in each case the impression upon the sense of smell and determining at the same time the amount of CO_2 in both the out-door and in-door air. He found that as long as the CO_2 , due to respiratory impurity, did not exceed 0.02 per cent., the in-door air did not differ sensibly from the outer air; that when the respiratory CO_2 reached 0.041 per cent. the air was rather close and the organic matter was becoming perceptible, etc. Subsequent investigations have shown that as long as the CO_2 of respiratory impurity does not exceed 0.02 per cent. it has no perceptible effect upon the health of the inhabitants; consequently, we may take this amount of carbon dioxide, over and above the amount normally present at the time in the outer atmosphere, as our limit of permissible impurity.

Knowing now the amount of carbon dioxide exhaled by each person and the permissible impurity, it becomes a matter of simple proportion to determine the amount of fresh air to be supplied to each individual, provided there are no other sources of contamination of the air. The equivalent of 0.02 per cent. of CO_2 is

0.0002 cubic feet, CO_2 in each cubic foot of air. In a mixed assembly each person exhaling 0.6 cubic foot CO_2 per hour. Consequently, to properly dilute this amount of CO_2 , each person will need $\frac{0.6}{0.0002}$, or 3000 cubic feet of fresh air per hour. And so, if the individuals are adult males, or if they are working, a corresponding increase must be made in the air supplied, running up to 6000 cubic feet or more in certain laborious occupations. If there are other sources of vitiation, similar provision must be made for sufficiently diluting the resultant impurity. Without going into details, it will suffice to say that, although combustion products are probably not usually as dangerous as bodily impurities, and though they are generally to be found near the top of the room, we should still provide at least 1800 cubic feet of air for each cubic foot of gas burned, and about ten times as much for each pound of oil consumed. It is worth nothing here, however, that where the electric light has been substituted for gas in large offices, etc., the improvement in the health of the inmates has been marked; the saving of time on this account in the Victoria Bank of London is said to have been sufficient to pay for the increased cost of electric lighting.

In the case of sick-rooms and hospitals an exception must be made to the above equation, in which 0.02 per cent. CO_2 is taken as the limit of impurity. It is found that the organic matter exhaled from the sick is much more offensive than that from the healthy, and is noticeable to the senses even when the respiratory CO_2 is much below 0.02 per cent. So, in practice, one-fourth and sometimes more fresh air must be added to the usual amount supplied to the healthy per head. In fact, the rule is to give the sick as much fresh air as possible, provided it be suitably warmed and properly distributed so as not to cause annoying or harmful draughts.

In the solution of any problems relating to ventilation and air-supply it will often be advisable to make use of the following formula: $\frac{e}{r} = d$, where e = the amount of CO_2 exhaled in the given time, r = the respiratory impurity and d = the delivery of fresh air in cubic feet per hour, provided r be given in parts per cubic foot. For example, suppose we have three men occupying a room for two hours and the respiratory impurity is found to be 0.07 per cent.; what amount of fresh air has been delivered in that time? Here e will be $.7 \times 3 \times 2 = 4.2$, and r will be 0.07

per cent. = 0.0007 (cubic feet CO_2 in 1 cubic foot of air). $\frac{4.2}{0.0007}$
 = 6000 = cubic feet of air supplied *plus* the amount in room at
 the beginning of given time. So also we may use the formula to
 find the probable condition of the air at any time, knowing the
 number of persons, the time the room has been occupied and the
 amount of air supplied, etc.

Why Grow Old? ¹

BY DR. N. E. YORKE-DAVIES.



IT may seem a curious assertion to make, but it is nevertheless an absolutely true one, namely, that a man's life is not measured by the years that he has lived, but by the way in which he has spent them. Many a person may be as young and active at seventy as another at twenty-five, and the length of his life, his health, and his ability to enjoy green old age, depend in a great measure on what the surroundings have been in the earlier years of existence. It is perfectly true that every one may not be born with a strong and healthy constitution. There are certain constitutional defects that are hereditary in certain families, and these under certain circumstances may influence length of life. For instance, we may inherit the scrofulous taint and fall victims, if not careful in early life, to consumption. We may inherit the gouty taint, and be subject to all the ills that this disease entails in middle age in those who do not learn to diet themselves. We may be born of families in whom the tendency to obesity is more than usually developed, and this in advancing life may be a serious drawback to comfort, and will undoubtedly tend to shorten existence. But all these weaknesses and idiosyncrasies of inherited constitution may be wonderfully improved, and even, eventually, entirely remedied, if in early life proper care in regard to exercise, food, fresh air, and those surroundings which tend to

¹ From The Gentleman's Magazine.

strengthen the system and improve constitutional stamina, are made a part of the daily routine.

A boy or a girl should be trained to indulge in athletic exercises of some kind, so that the habit of taking exercise may become established, and this, once acquired, is seldom neglected, even as years advance. The boy who is fond of football, cricket, tennis, and other athletic games will, from the simple love of emulation, always keep up his muscular and nervous strength, and this will stand him in good stead in middle age, and even in a greater degree in old age.

In a former article in this magazine I gave some statistics with regard to the after career of university men, and those statistics proved that their lives were longer than those of others who in college life were of a more sedentary habit. That is, they lived and are living to beyond the average duration of life at any given age. Some who have come to me of late, to remedy by dietetic means—the only means I adopt—the tendency to obesity or gout, have been fine specimens of physique.

We all know that a seed planted, whether it be a grain of wheat or an acorn, depends for its proper development upon careful manuring and proper attention in its early existence, as to whether it becomes a strong plant or dies in its infancy. If it is planted in congenial soil, and is properly watered and cared for, it will live and grow luxuriantly; but if in improper soil, and left to take care of itself, it will possibly soon die. It is the same with a human being, and however weakly it may be as an infant, if it is properly nursed and taken care of, the foundation is often laid of a mature and sound constitution.

The law of the survival of the fittest may, in some instances, be a cruel one; but it is a beneficent one, for it does not seem right that those entering the world should be handicapped with the weaknesses of their ancestors, and those who have the well-being of the race at heart hold the opinion that constitutions that inherit any strongly marked hereditary weakness should not be allowed to contract obligations that may and will entail suffering upon a future generation.

We do not attempt to rear plants and flowers from imperfect specimens, nor does the agriculturist breed his stock from any but the best and healthiest in any class that he may wish to propagate, and surely the same amount of care and selection should be used with regard to our own species. In the higher

ranks of life we see better specimens of the English race than in the lower ones, for more care is exercised in this respect. Something more, of course, must be allowed for this greater care and attention bestowed up to adolescence. Whereas it is estimated that out of every million people born, only 90,000 reach the age of 80, 11,000 that of 90, and 2000 the age of 95—really, treble that number should reach these respective ages; in fact, if all the surroundings of life in every way were as they should be, there is no reason why six times the number should not reach these ages.

Much of the comfort of middle and old age depends upon early training and early feeding, and I refer here more particularly to school life. Neither mind nor body should be *forced*. While the intellectual faculties are being trained, the bodily requirements should be attended to. The constitution is being built up during the years that a boy is being educated for his pursuits in after life. I can remember my own life at a well-known school in a fashionable town five-and-thirty years ago, and I often wonder I survived it when I recall many circumstances. No proper care was taken of us; hunger, thirst, badly cooked meats and vegetables, sanitary defects, were the rule. Many a time, hungry as a schoolboy should be, have I had put before me for dinner meat that was scarcely warmed outside, and this or nothing had to be my meal. Had it not been for an old man who used to come to the playground selling buns and cakes, I do not know how at times we should have endured the pangs of hunger, or subsisted on the scanty fare allowed, even had it been properly cooked, which it seldom was. Fortunately, nowadays, I believe, the *cuisine* in public schools is much improved, and more care is taken that growing boys should have a sufficiency of those foods that lay the foundations of a sound constitution in after life. A parent would do well, before sending his progeny to school, to see that the ventilation of the rooms, the sanitary arrangements of the school, and the diet and the capabilities for gymnastics and outdoor exercise are adequate. These things are of as much, if not of more, importance than the knowledge of Greek and dead languages, etc. There is every reason why, while the intellectual faculties are being trained, proper care should be taken of the material part; in fact, a boy's mind cannot be stored with information which may be useful to him in after life, and the health maintained at a standard to resist disease, if, at the same time, the

brain is not fed by proper food, and the constitutional stamina kept up by exercise and fresh air.

There are some diseases due to carelessness in early life that leave traces that may handicap their possessor throughout existence, and possibly the worst of all is rheumatic fever. In this case, mischief may be done to the heart that can never be remedied, and, therefore, it is necessary in the days of adolescence, when the individual is careless of consequences, that a boy or a girl should be properly clad, and more especially that the covering next the skin should be flannel. The tendency that rapid changes of temperature have to induce this disease where an individual inherits the gouty and rheumatic diathesis, should make its prevention a matter of great importance, and much may be done by forethought and care to obviate the risk. Another result of school life that may bear bitter fruit in after life, that never seems to have attracted the attention it should do, is that the weak and the strong are allotted the same amount of intellectual work. This should not be. "The wind should be tempered to the shorn lamb," and the amount of intellectual work of each boy should bear some proportion to his physical and mental power.

Of course, it would be useless to expect the young to apply to themselves rules that bear fruit when they get to middle and old age. They are too young to have forethought and to understand that, like a bottle of new port, they ought to carefully mature, so as to improve as time goes on. It is a melancholy circumstance, as I have seen even recently, a lad, unfortunately left with boundless wealth and a great name, beginning life at 17 years of age, and becoming a prematurely old man at 24, and there are few medical men of large experience who can not recall numerous instances of men who have overdrawn their constitutional bank before the age of 20 to such an extent that the account can never be placed on the right side on this side the grave.

If I were asked what factors would conduce to green old age, and the ability to enjoy life to past the eighties, I should say it was a matter of plenty of good food, fresh air and exercise in early life. But alas! how few people take the trouble to consider for one moment what food would be most suitable for their particular requirements, or the requirements of their children, at a time when this is all-important! We cannot put old heads on

young shoulders, but we can suggest to those who have young lives in their charge that they have a serious trust, and what their duty is in this respect.

We know that meat and bread furnish all that is necessary to sustain life, but, of course, we do not live on meat and bread alone. The ordinary living is made up of thousands of different articles in daily use. Still, there are certain rules that particularly apply in this way, that certain constitutions require a larger proportion of one particular class of food than other constitutions, and the man who does a large amount of physical labor requires a different mode of dieting from one who is sedentary. It would be impossible to enter into a subject of this kind at length in a short article. Diet, however, undoubtedly has much to do with long life, and this more especially applies in its application to the particular calling of each individual. The engine of an express train is coaled differently from that of a slow one. A race-horse is fed and exercised differently from a cart-horse, etc.

A man brought up in an active occupation that entails a certain amount of muscular exercise can take an amount of food that a man of sedentary habits would not stand, and therefore a certain difference should be made in the composition of the diet taken by the two. Food is simply fuel, and in a general way answers the same purpose.

As Dr. B. W. Richardson, in his interesting work, "Diseases of Modern Life," observes: "The English middle class, who may be exhibited as types of comfortable people, moderately provided for, take on an average twelve ounces of mixed solid food for breakfast, twelve ounces for midday meal, or luncheon, and from twenty to thirty ounces for their late modern dinner or ancient supper. A total of from forty-five to fifty ounces of solid sustenance is in fact taken, to which is added from fifty to sixty ounces of fluid in the way of tea, coffee, water, beer, wine. This excess is at least double the quantity required for the sustainment of their mental and bodily labor."

He then gives a good illustration of this, and says: "I was once consulted in respect to the symptoms with which the idle inmates of a large and wealthy establishment suffered. I was told that an affection very much like dysentery had become developed, and was unusually obstinate to cure. The water supply of the establishment, the drainage, the ventilation, had all in turn been blamed and altered to no effect. I found the unfor-

fortunate sufferers were sitting down regularly to four heavy meals a day, with animal food at each meal; that they took between meals no exercise adequate for utilizing a little of the potential energy that was stowed up in their tightly packed organisms.

"This one fact seemed to me sufficient to account for the phenomenon, and the instant relief that followed the cruel prescription of 'double the work and halve the food' was proof direct that the process of cure was immediate."

This quotation I reproduce as illustrating what I have pointed out, that the amount of food should be adapted to the requirements of the system, and to the amount of physical or intellectual work done, if it is not to be harmful in some way. If these individuals had been huntsmen or whippers-in to a pack of hounds, the food would probably have been just sufficient for the requirements of the system. If we want to see good illustrations of green old age, we must look for it in men who are noted for their physical and intellectual vigor; and a man who takes active exercise, whether in cutting down trees or in brisk walking and other physical pursuits, and in addition to this does plenty of brain work, lives carefully and drinks but very moderately, may, long after he is an octogenarian, control the destinies of a mighty nation, and give indications of mental and bodily vigor that would shame many half his age. The wiry frame of such a man will be vigorous when the obese and sedentary individual of the same age has drifted into senility and second childhood.

There is no more fatal barrier to long life than obtains in the case of a man who has until middle age been used to active occupation, and been employed in business pursuits that have engrossed his time and energies, and then suddenly retires to a life of ease, luxury and enjoyment. The revulsion that such a change entails seems to throw the whole human machine out of gear. The surroundings in the way of diet and exercise are seldom considered and adapted to the altered circumstances, and the result is that the different organs that looked to the stimulation of active occupation to keep them in working order, become clogged with waste; and those diseases that depend upon such a state of affairs, such as congested liver, indigestion, obesity, gout, bronchial troubles, etc., soon manifest themselves. Does not this equally apply to any piece of mechanism? Even take a clock, for instance; if dust, rust and dirt are allowed to accumulate in its working parts, how soon (be its steel ever so highly tempered)

does the friction of adventitious matter throw its harmony of movement out of order !

Work of some kind or another seems essential to the well-being of the human organism. Even a machine keeps in better order when it is worked, looked after and oiled, than when it is neglected and allowed to rust. Up to middle age persons may indulge in any amount of hard physical exercise—that is, if they are wiry and of proper physical proportion ; but if a tendency to corpulency supervenes, certain changes in the blood vessels and other organs, on whose healthy action robust health depends, take place. These become weakened and altered in texture, so that any attempt at undue exercise is attended with a certain amount of risk. Hence, any one who wishes to live to old age, and enjoy it, should look with anxiety at the first indication of corpulency. How many patients have consulted me to whom I have pointed out personally, or by correspondence, that they have carried for years an unnecessary burden in the way of surplus weight ; and after, by proper dietetic treatment, they have been relieved of it, with improvement in health and condition, they have regretted that for so many years they should have been weighted with a useless and uncomfortable load.

Of course, the tendency to corpulency is a very common one, and I know of no condition that tends to shorten life and to make it more of a misery, especially as years advance. The extra work of carrying unnecessary fat entailed on the heart alone is quite sufficient to shorten life ; but, worse than this even, it lays the system more open to congestive disease, and less able to bear treatment for their cure. It is the greatest bar to enjoyable old age. I suppose my experientiae of this condition is exceptional, as I devote the whole of my professional time to remedying it and a few other diseases of malnutrition, by a system of scientific dieting now well known. As this condition is the result of taking certain foods in undue proportions, its remedy lies in properly apportioning these ; and as soon as those who unduly increase in weight are taught what the injurious ingredients of their daily diet are, and advised to curtail them for a time, the result is that they lose unnecessary tissue rapidly and safely, with improvement in every way.

For a month or two the daily intake of food and its constituents must be carefully adjusted. No purgative or other medicine is necessary for the purpose ; indeed, violent purgative medicines

are absolutely injurious, as they simply wash the food through, without giving it time to nourish the system, and debility, palpitation of the heart and loss of condition result. Of course, a little mild aperient, in the shape of some natural mineral water, is always harmless, and most people, from errors in diet, require something of this kind occasionally. Electrical appliances and electric baths are quite useless as fat-reducing agents. Quack remedies of all descriptions should be avoided like poison; if they reduce weight they do it at the expense of health. Of this I have seen repeated examples, and this induces me more particularly to make these observations.

The meager diet and quantity of water drunk at some of the spas abroad, of course, clears the system of waste; but this is only a temporary benefit, as the individual is not taught what little alteration he should permanently make in his diet. He comes home to his luxurious surroundings and rapidly recharges the system with fat, gout poison and other injurious products that form the elements of certain food which he takes in too great excess.

Exercise, proper selection in diet and a little abstinence are better means of warding off an attack of gout than all the spas in existence, and the symptoms of an impending attack are well known to sufferers. As soon as the system is overcharged with the poison, an acute attack comes on. How much better to prevent the system being charged at all with an unnecessary poison, and this is only to be done by a proper selection in diet! Hard-worked laborers and the poor never suffer from gout, and the Scotch are entirely free. It is a disease of overfeeding—more especially in certain articles of food and drink—and underworking, and entails on its victim much misery, if not worse, and his progeny inherit the curse for generations after.

The evils that arise from errors in diet are properly remedied by diet. An excess of fat invariably depends upon the individual indulging to too great an extent in sweets and farinaceous food, and in not taking sufficient exercise to work it off. The surplus in such a case becomes stored in the system as fat, and can easily, as previously pointed out, be got rid of by a properly constructed dietary. This may be very liberal indeed, but all fat-forming ingredients must be carefully cut off. I have known twenty-five pounds of fat lost in a month by dietetic means alone, with vast improvement in the general health and condition. Indeed, a loss

of surplus fat always means a great improvement in condition as well as in activity and vigor.¹

Different constitutions have peculiarities in regard to the way in which they assimilate food, and the old adage that what is one man's meat is another's poison is a very true one. There is no ailment more common in middle life and in old age than indigestion. This, of course, depends upon improper food taken too frequently and in undue quantity. As a rule, the victim of indigestion flies to medicine for relief, or to one of the thousand-and-one quack remedies that are advertised to cure everything.

How much more rational would it not be to alter the diet, and to give the stomach the food for which it is craving! If the stomach could talk, I can imagine it after pills, and gin and biters, and quack remedies of every description have been poured into it, begging to be relieved of such horrors, and saying: "Give me a little rest, and a cup of beef tea and a biscuit, and go and take a little fresh air and exercise yourself." Instead of this, the miserable organ has to be dosed with all sorts of horrible concoctions in the way of drugs, brandies and sodas, and champagne, to endeavor to stimulate it into action. There is no doubt that the stomach that requires stimulants and potions to enable it to act efficiently can hardly be said to be in a healthy state, or can long continue to do its work properly.

The digestive organs, unfortunately, are the first to sympathize with any mental worry. They are like a barometer, and indicate the errors of malnutrition and their consequences. The healthy action of every organ depends upon the proper assimilation of the food taken. As soon as the digestive process fails everything fails, and ill-health results with all its disastrous concomitants.

Indigestion is more particularly the ailment of those engaged in sedentary pursuits, and if a person who is frequently the victim of it would, instead of flying to drugs, try such a diet as the following for a few days, he would not regret doing so. At least, this is my experience:

He should begin the day at 7 A.M. with a tumbler of milk and soda water, or a cup of Liebig's beef tea, or of bovril. At half-past seven he should take a tepid or cold sponge bath and rub the skin thoroughly with a coarse towel, or, better still, before

¹ See *Foods for the Fat: the Dietetic Cure of Corpulency*, by Dr. Yorke-Davies. London: Chatto & Windus.

the bath, with a massage rubber. At half-past eight, for his breakfast, one or two cups of weak tea, with a little milk and no sugar. A little stale bread or dry toast. A grilled sole or whitening, or the lean of an underdone mutton chop, or a newly laid egg lightly boiled. For luncheon at one, a few oysters and a cut of a loin of mutton, some chicken or game, or any other light digestible meat. A little stale bread and a glass of dry sherry or moselle. Such a one should avoid afternoon tea as he would poison, and at six or seven have his dinner, which should consist of plainly cooked fish, mutton, venison, chicken, grouse, partridge, hare, pheasant, tripe boiled in milk, sweetbread, lamb, roast beef, and stale bread. French beans, cauliflower, asparagus, vegetable marrow, or sea kale may be used as vegetable, and half a wineglassful of cognac in water may be drunk. If he takes wine, one or two glasses of dry sherry after dinner, and before retiring to bed a cup of Liebig's beef tea and a biscuit may be taken.

During the day brisk walking exercise, to an extent short of fatigue, should be indulged in, or riding or cycling, as the case may be.

Such an individual in a few days would find himself a different person. Slight ailments of this kind, and errors of malnutrition, are much better treated by diet than by medicine. Of course, there are certain habits that are not conducive to long life, such as immoderate indulgence in the passions, whatever they may be, and the abuse of alcohol. There is no reason why a man should not enjoy, in moderation, all the good things of this life, and really the enjoyment of them means taking them in moderation. The man who enjoys wine is the man who takes just sufficient to do him good, and the man who drinks wine to excess, and suffers the next morning from headache as a consequence, cannot be said to do so. Excess in alcoholic stimulants in early life means sowing seeds that will bear bitter fruit in mature age—if the individual lives to see it. The habit of "nipping" is conducive to shortening life more than any other habit. It stimulates the different organs of the body into unnatural activity, and the result is that certain of them, such as the liver and the heart, by the work thrown upon them, become, through the enlargement and engorgement of their tissues with blood, diseased after a time. This leads to their being useless as organs of elimination or of healthy structure, with the result

that, when middle age is just over, the individual becomes prone to such complaints as Bright's disease, dropsy, cirrhosis of the liver, and other vital indications of decay. These habits are acquired in early life. The wind is sown then and the whirlwind is reaped later on. It is seldom that the young will learn the importance of, if I may so express it, training for old age, but there are exceptions to this rule. Only a few days ago a man came to consult me; he belonged to the luxurious classes, and, though only 23 years of age, seemed to have the forethought of a man of 60. A fine, handsome young fellow of nearly six feet, he said to me: "Doctor, as most of my family have died young through becoming excessively fat, I want to know what I am to do to avoid this. I am already heavier than I should be." Now, a man in the full enjoyment of health and bodily vigor, who had so much foresight, and who wished to learn the means of attaining green old age, which he saw would be sapped by a hereditary tendency to obesity, undoubtedly deserves to do so, especially as the particular condition that he dreads can be so easily benefited without debarring him almost every luxury within his reach.

If more people followed this example, how many years longer would the average life be, and how much more pleasant would life become! One of the greatest barriers to the enjoyment of old age is the condition that this young man dreaded; and my experience is that the food of old people is by no means always what it is wise for them to take. It seems to be the general opinion that old people should be always eating, that they should be stuffed, and that farinaceous food is what they should principally take. This, every one knows, tends to develop corpulency, which is, as I have explained, a most undesirable condition.

I find that if old people are put on a good meat diet in the way of strong soup, beef tea and animal food, and only just sufficient farinaceous food and fats and sugar to maintain the heat of the body, they increase wonderfully in energy and, as they often express it, feel twenty years younger. This is only natural; it is a food of energy; the food that builds up muscle, nerve and constitutional stamina.

The requirements of the system in old age, as a rule, are not very great, and more harm is done by taking too much food than by taking too little. I have known people considerably over 70 derive the greatest benefit from a thorough change in diet. It

seems to rejuvenate them. Of course, in old age care should be taken that the body is not subjected to rapid changes of temperature. When the nervous power is decreasing as the result of age, and the system is losing the power of combating cold and strain upon its energy, a stimulating diet invigorates, and is conducive to maintaining constitutional stamina better than any other.

Any natural death but from old age and general decay is an accidental death; that is, it is due to causes which might, and even perhaps could, have been entirely avoided and remedied in earlier years. But, of course, all the secrets of attaining extreme age are not even now within our reach, and the few that I have pointed out are but a very few, and those of the commonest. It is the inevitable law of Nature that we must die. The vital energy that is implanted in the body at birth is only meant to sustain it for a certain number of years. It may be husbanded or wasted, made to burn slowly or rapidly. It is like the oil in a lamp, and may be burned out to little effect in a little time, or carefully husbanded and preserved, and thus made to last longer and burn brighter. It is a moot question whether every individual is not at birth gifted with the same amount of vital energy and of life-sustaining power. The probability is that each is. The circumstances of the environment from the cradle to the grave determine its future destiny.

It is a well-known fact that half of the infants born in certain crowded streets in Liverpool die before they arrive at the age of one year, whereas, under ordinary or healthy surroundings, a half would not die within the first five years of life. Why is this so? Simply because the surroundings are so detrimental to healthy development. Again, consumption is fatal to 60,000 people in England alone, annually, and this is a disease born of hereditary taint, due to unhealthy surroundings and other health-depressing influences. In fact, as I have before said, most of the diseases which destroy in early life are due to causes which ought not to exist, and in time, as sanitary science advances, will not exist. We know that already the improved sanitation of the country is bearing fruit, that the average life is lengthening year by year, that many diseases that carried off tens of thousands in the days of our grandfathers are almost harmless now.

Smallpox has lost its terrors. The causes of such fatal diseases as typhoid, diphtheria, etc., are well established, and doubtless, in time, these plagues will be rooted out.

Last year we escaped an epidemic that might have carried off hundreds of thousands, and why? Because we know its ways, and have not allowed it to spread in the country. The highest duty of the State is to guard the health of the people, and public opinion of recent years is waking up to this fact. An epidemic is no respecter of persons; it may have its origin in the hovel of a pauper, but its baneful influence reaches the lordly palace of the noble, and it engulfs all classes in its deadly embrace. The aristocrat and the plebeian are socially separated by a very wide gulf, but as far as epidemic disease goes they are coterminous. Social distinctions are no barrier when the angel of death is following in the wake of those plagues that destroy life before its natural termination in old age and general decay.

To sum up, if old age is to be put off to its furthest limits, the individual who wishes to attain it should live carefully up to middle age, taking plenty of exercise, and so adapting the diet that corpulency, gout and other diseases due to taking too much and improper food without doing sufficient work to consume it, cannot be developed. Mental and physical occupation are an absolute necessity, if the constitution is to be kept in healthy working order, and this applies equally to both sexes. The human economy will rust out before it will wear out, and there are more killed by idleness than by hard work. Human energy must have some outlet, and if that outlet is not work of some kind habits are acquired that are not always conducive to long life.

Old age is the proper termination of human life, and, as Cicero says: "The happiest ending is when, with intellect unimpaired, and the other senses uninjured, the same Nature which put together the several parts of the machine takes her own work to pieces. As the person who has built a ship or a house likewise takes it down with the greatest ease, so the same Nature which glued together the human machine takes it asunder most skillfully."

Death by extreme old age may be considered the desirable end of a long-continued and at times weary journey. The pilgrim begins it in infancy, full of hope and life; continues it through adolescence in its roseate hue; and onward until middle age, with its cares and anxieties, begins to dispel the illusion. Then comes the time of life when vitality begins to decline, and the body to lose its capacity for enjoyment; then comes the desire for

rest, the feeling that foreshadows the great change ; and if this occurs in extreme age, the sufferer seems to fall asleep, as he might do after severe fatigue.

So the long and, in many cases, the weary pilgrimage of life is brought to a close with little apparent derangement of mental powers ; the final scene may be short and painless, and the phenomena of dying almost imperceptible. The senses fail as if sleep were about to intervene, the perception becomes gradually more and more obtuse, and by degrees the aged man seems to pass into his final slumber.

In such an end the stock of nerve-power is exhausted—the marvellous and unseen essence, that hidden mystery, that man with all his powers of reasoning, that physiology with all the aid that science has lent it, and the genius of six thousand years, has failed to fathom. In that hour is solved that secret, the mystery of which is only revealed when the Book of Life is closed forever. Then, we may hope, when Nature draws the veil over the eye that is gazing on this world, at that same moment she is opening to some unseen but spiritual eye a vista, the confines of which are only wrapped by the everlasting and immeasurable bounds of eternity.

Is the Average Civilized Woman Deformed ?¹

BY J. H. KELLOGG, M.D.,

Of Battle Creek, Mich.



THE writer has often astonished an audience by the assertion that the modern civilized woman is deformed, backing up the statement by a presentation of the evidence that the small waist of which the fashionable woman is proud to find herself the possessor, and which she so assiduously cultivates, is quite unnatural, and, from a physiological standpoint, a serious deformity.

A deformity is any considerable deviation of the body from the natural form, whether it be a club foot, a twisted nose, a humpback or a furrowed waist, and whether it be congenital or

¹ From the Bacteriological World.

acquired. The existence of a flat or furrowed waist is so nearly universal among civilized women that even anatomists have come to consider this peculiarity of outline as a natural characteristic, and so put it down in the text-books for medical students. A careful study of this matter has, however, convinced me of the error of this provision. A flat or furrowed waist is the indication of prolapsed viscera, whether found in women or in men.

The natural contour of the abdomen is slightly convex. The curve is a continuous one from the upper end of the breast bone to the pubic bone, showing a slight flattening only at the "pit of the stomach," or epigastrium, a point located at the lower end of the sternum, or breast bone. The flattened or furrowed waist almost universal among women who have attained the age of twenty years, and who are not naturally obese, is directly the result of wearing tight clothing, and indicates as plainly as the most critical examination could do, that the abdominal organs which belong to the upper part of the abdomen have been thrust or dragged down by mechanical means. The stomach, liver, pancreas, kidneys and spleen occupy that portion of the trunk which falls beneath the belt, as ordinarily worn. If the belt is drawn so tightly as to narrow the natural diameter of the trunk at this point, some or all of the various organs named must change their position, moving either upward or downward according to the direction in which the least resistance is offered. In order that this effect should be produced, it is not necessary that a woman should practice what is commonly known as tight lacing, that is, that extraordinary effort in which force is applied to constrict the waist. It is only necessary that the corset, waistband or belt should be applied so as to be what is sometimes termed "a skin fit" when the body is in a state of rest. A band or belt which restricts the body to its diameter when at rest, must be a sort of physical mischief causing serious injury.

In activity, the soft parts of the body always undergo a change in form. A muscle, when acting, swells as it shortens, thus increasing its diameter, and accordingly that of the limb to which it is attached. The reality and extent of this expansion during activity may be readily appreciated by grasping the upper part of one arm with the hand of the opposite arm, then forcibly bending and extending the elbow. The amount of increase in size required for the proper expansion of the muscle of the upper arm may be an inch. The waist is much larger than the arm.

It is true that it is not a solid muscle, but this is also true of the arm, which contains bone as well as muscle, and it should also be noted in the case of the arm that a single set of muscles is brought into activity at one time. The bulk of the muscles located in the line of the waist, and which are constantly in action, is several times that of the active muscles of the upper arm. All muscles require increased room when they contract, and hence the muscles of the chest, by their action, tend to increase the size of the chest.

There are also two other causes of waist expansion, both of which are even more important in their influence and larger in their effects than the one mentioned. These are—

- (1) The action of the diaphragm, and,
- (2) The elevation of the ribs.

The diaphragm rises into the chest, forming a sort of dome-shaped roof for the abdominal cavity. The liver, stomach, spleen and other organs occupy the upper part of the abdominal cavity, and are in close proximity with the diaphragm. In breathing, this muscle contracts, and in so doing necessarily forces downward all the organs occupying the upper part of the abdomen. As the abdominal cavity is shortened in length, it must necessarily increase in width, as its volume must remain precisely the same, since there is no natural means by which the natural volume of its contents can be appreciably diminished. This downward action of the diaphragm thus causes, in children, men and natural women, a very marked swelling of the waist, acting especially to increase the diameter of the waist antero-posteriorly, or from before backward.

The external muscles of respiration are chiefly attached to chest walls on the sides, and act in such a manner as to separate the points of the ribs at the lower part of the chest; or in other words, the effect is to broaden the walls of the chest or to increase its diameter from side to side, whenever air is taken into the lungs in breathing.

The three causes mentioned result in an expansion of the waist in ordinary respiration from one-half inch to one inch. When the activity of the lungs is increased by walking, running, singing or other exercises, the amount of waist expansion observed in healthy individuals in whom the normal breathing movements are unimpaired, is very greatly increased, varying according to the age of the individual and the degree of activity, from an inch

and a half or two inches to three or four inches. Coughing, singing, yawning and other involuntary acts in which the breathing movements are especially increased, produce the same effect.

The conventional dress of the civilized woman in this enlightened nineteenth century, utterly ignores the pathological effects mentioned, which do not belong to the domain of occult or technical knowledge, but are familiar to every school girl. Any woman to whom the facts stated may be new, has but to make a few observations upon infants, young children, and even upon herself when the waist is wholly untrammelled by constricting bands or the dragging of heavy skirts.

It must be apparent, then, that "*tight lacing*" is not necessary to produce a flat or furrowed waist and all the evil consequences which are associated with the deformity. It is only essential for the production of these evil results that the clothes should be so adjusted as to prevent the natural expansion above described. A band which is only skin tight, or not really tight at all, but an easy fit at the waist when the body is at rest and the breathing movements are comparatively slight, or perhaps even suspended, as is probably the case most commonly when the waist measure is taken, becomes really a decided constriction as soon as the breathing movements are increased by bodily activity of any sort.

The unnatural desire for a smallness of waist which is neither healthful nor beautiful, although prescribed by the fashion plates and the "modes" of the dressmakers, has caused civilized women to subject their bodies to maltreatment of the most injurious character. The complacency with which women bind constricting belts about their waists, and hang thereon a heavy load of dragging skirts, the constant strain and pulling of which must inevitably result in the displacement of some of the most important organs of the body, is thoroughly astonishing. Nothing but the densest ignorance or the most unaccountable obtuseness to the natural requirements for the well being of the body, can explain such gross and such universal disregard of the plainest physiological laws. All this abuse of the body seems to be the result of a perverted notion that the female figure is not properly constructed, and needs reconstructing. The mischief which women have done themselves by this neglect and abuse, is clearly shown in the general decline in woman which has won for her the title of the "weaker sex," and it has given rise to a multitude of mal-

adies peculiar to women, which are most destructive to the individual woman, and which impair the vitality of the race and even threaten its decline and possible extinction, as evidenced by the rapid depopulation going on in France at the present time.

Women are beginning to awaken to the fact that a large part of the "side-aches," "back-aches," aching nerves and neuralgias, headaches and prostrations, are nature's warning against the violation of natural laws; and they are beginning to heed these natural voices, which have hitherto been to them an unknown tongue. But the great multitude are still in ignorance, and abjectly worship the remorseless Moloch which has accomplished more in weakening the race and destroying human lives within the last century than have either war or pestilence.

Every woman ought to be a self-appointed missionary, preaching the gospel of emancipation from the fetters of conventionalism, and teaching the better way in dress, which means for both women and men a higher and better life, and deliverance from a "sea of troubles" which has long beset them. And every physician ought to be an apostle of the doctrine of sensible and rational dress reform.

Disposal of the Waste of Cities.¹

BY S. S. HERRICK, M.D.,

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THE suitable disposal of the refuse of cities is a serious question in relation to the comfort and health of their inhabitants. It has engaged the special attention of the American Public Health Association, and in 1887, a Committee on the Disposal of Waste and Garbage was created, which has made three reports. The last, made in 1891, furnishes much of the material used in this article.

It is obvious that conditions vary so much in different cities, that no detailed plan could be made applicable to all. With reference to night soil, proximity to the sea, or a large lake or river,

¹ Read before the State Sanitary Convention, at San Francisco, April 17, 1893.

affords an outfall which will continue to be used, though we hope that eventually so great an amount of fertilizing material will not be allowed to run to waste. The application of sewage to cultivate lands has been in successful operation in many inland cities and towns of Europe, and even on the sea coast. A beginning has been made in the United States, and in California, Los Angeles deserves the credit of taking the lead. So far few of these enterprises have been made self-supporting, but in all the value of the land irrigated has been greatly enhanced, and at Pullman, Illinois, it is said that some profit above annual expenses has already been derived from sale of products. Similar examples might be instanced in England, France and Germany. As to San Francisco, it is not to be expected that any other disposal will soon supersede the consigning of night soil to the bay; but it is to be hoped that Sacramento and San Jose may not long delay imitating the example of Los Angeles, and may be followed by other inland cities.

The problem here has reference chiefly to the disposal of household garbage, shop refuse, and street scrapings, which has not advanced beyond the primitive and barbarous plan of the open dump on vacant lots. The offenses thereby committed against the senses are too familiar to need description at home, and I shall not attempt to expose their abominations to those who have been spared the spectacle. My object is rather to inform those who suffer from such mismanagement how other communities have succeeded, with no great expense, in abating the nuisance. I should not recommend the custom which I observed in 1854, at Buffalo and Cincinnati, where kitchen and market refuse were thrown on the street to hogs, which enjoyed "the liberty of the town." The custom has probably gone out of public observance, but it is a well-known fact that these animals are still made useful in retirement at a number of the smaller cities. The plan of burying in pits outside the city limits, as at Chicago and Toledo, must soon be abandoned, for want of space, and, if effectual, must cost more than cremation.

The great desiderata are, the avoidance of long haul, economy of working appliances, and utilization of valuable products, while obviating all offense to the senses. A variety of apparatus has been devised to meet these requirements, some of which will here receive attention.

It must be observed that any mode of utilization, except the

Chelsea process hereafter to be described, requires street sweepings and ashes to be kept separate from animal and vegetable refuse, which is an important deviation from the primitive dumping process, whether on land or water. The former substances can be used for filling low places within city confines, and are generally worth the cost of hauling. San Francisco has outgrown suitable limits for disposal of kitchen refuse by feeding swine. Owners of stables willingly haul manure to gardens within a reasonable distance and give it away, but much still has to go to the dumps. It is practicable to dry, compress and bale such matter, so that it might be transported to the country, but whether its value to farmers would leave a margin of profit after paying carriage is a question to be settled with transportation companies. The latter ought to favor a scheme calculated to increase crops and advance their business.

Within the last eight years cremation furnaces for dealing with garbage have been put in operation in a number of the cities in the United States; the Merz, Engle, and Rider Furnaces being mostly employed. At Montreal, with a population of 150,000, a contract has been made with the inventor of the Mann Furnace, to collect and cremate the garbage for \$43,000 annually. It is removed from every house twice a week, being deposited in barrels upon the sidewalk. This would make the average cost for each family about \$1.50 per annum, while in San Francisco the expense is double to have it removed to the dumps.

The cost of operating the Mann Furnace is estimated at twenty-five cents for every ton of ordinary refuse consumed. The apparatus used at Montreal cost \$18,000, and is said to consume 100 cubic yards, or forty tons, with three tons of coal.

The Engle destructor, used at Des Moines and Minneapolis, has been found to dispose of refuse, consisting largely of carcasses, for less than twenty cents a ton.

The Merz or Vienna system was used in six or seven cities of the United States, in 1891. The process is not cremation, but desiccation in closed cylinders by steam, at a temperature of about 300° F. The dryer is surrounded by a larger cylinder, and steam is admitted into the space between the two. Each dryer contains about three tons of garbage, and the process occupies six hours, during which time about 60 per cent. of weight is evaporated. It has been said that there is some complaint of odors, but the dried stuff is almost inodorous. After drying,

the matter is subjected to the action of benzine, to extract the fat; the benzine is distilled from the dissolved fat, and the dry residue is then suitable for a fertilizer. Of its value I am not informed, but much depends on the cost of transportation. This process is applicable as a whole to kitchen refuse only, separate from ashes, etc. The drying feature might be applied to stable manure, after fixing the ammonia by a dilute acid; but cost of transportation might debar the practicability.

The Rider Garbage Furnace, as used at Pittsburg and Alleghany City since 1888, consists of two chambers of nearly equal size, separated by a bridge-wall of fire-brick three feet thick, with a semi-circle opening in the upper portion between the two, and both are covered by an arched dome of brickwork. The front chamber is the furnace proper, with a grated floor for consumption of coal, and the garbage is thrown through charging holes in the dome upon the floor of the second chamber. A smokestack, eighty feet high, is at the farther extremity of the second chamber. The furnace used at Pittsburg cost \$3750. In 1889 its average work was thirty tons, or seventy-five cubic yards daily, at an expense of nearly thirty-six cents a yard, or ninety cents a ton. Six men were employed, but it was thought that four would suffice. At Alleghany City, the plant cost \$5700, with estimated capacity of thirty tons daily. Two or three men are employed, only in the daytime, and the operating expense is said to be about \$150 a month. The Rider Furnace is reputed to be operated without offense to the senses.

The Engle Garbage Cremator was devised in 1886, and has undergone several improvements since. The first one was built at Des Moines, and in 1891 there were nineteen in use in various cities and towns. The process includes the consumption of all gases produced in the utilization of heat from consumption of garbage for its continuation. A rectangular brick structure has a furnace at each end and a garbage grate between, to which the refuse is fed through holes above. The gases are entirely consumed, and the garbage itself contributes heat to continue the combustion, which goes on day and night. These cremators are of four different sizes, with corresponding cost. The largest, adapted to the needs of a population of 12,000 to 25,000, is thirty-two by nine by twelve feet, with a brick chimney nine feet square, and seventy-five to one hundred feet high; and will consume seventy-five cubic yards of miscellaneous refuse easily in

twenty-four hours, including large animals, like horses. This work requires three men, and one or two tons of coal daily. The cost of a plant of the smallest size, for a population of 2000 to 3000, is estimated at \$2500 to \$3000, including the covering-house, platforms and approaches, but not the site.

Mr. Rudolph Hering, C.E., of New York, describes some services which he has examined in England, and which appear far superior in point of economy to the foregoing. The furnace destructor used at Southampton cost altogether \$18,600. The amount of refuse daily consumed is from twenty-five to fifty tons, at a total annual expense of \$1100, or seven to fourteen cents per ton. The process is so perfect that no coal is needed when well under way. The clinkers remaining are used in making roadways and paving slabs. The ashes have some value as a fertilizer.

Still better appears to be the system in use at Chelsea, operating on the refuse of Kensington and Westminster. The stuff is passed successively through several revolving cylindrical screens, of gradually diminishing mesh from ten to two and one-half inches to one-half inch in diameter. In this way all matters that can be utilized are sorted. Much is used as paper stock. Animal and vegetable refuse, after drying, is used for manure. Bottles and fragments of coal and metals, when separated, have some value. Even the ashes are mixed with clay to make bricks. Altogether, it appears that this plan is somewhat better than self-supporting; but I am not informed whether the company have the expense of gathering the refuse.

In 1883 a crematory was established at London, in which the garbage is dried on platforms arched over in the fashion of a reverberating furnace. The platforms slope to a central fire, and the dried matter is pushed there from time to time. When well under way the furnace needs no other fuel, and there is surplus heat to drive a steam engine for lifting the wagons to be dumped and to work up the residue into mortar with lime.

Another plan is described in Vol. XVII of the *Sanitarian* for 1886. Household refuse is placed in a retort and subjected to a process of fractional distillation. First, melted fat is drawn off through a cock; on raising the heat ammonia passes over; illuminating gas is produced at a higher temperature. Some coke remains in the retort, and the ashes contain potash. Cheap coal and close management might afford some profit.

The average amount of garbage and waste of the city of New York has been estimated at one cubic yard, or two-fifths ton, to every inhabitant per annum, including street sweepings and ashes, but not the night soil. Of this amount the proportion of putrescible matter, varying somewhat with the season, averages about 20 per cent. Applying such estimate to San Francisco, with a population of 320,000, we should have 64,000 cubic yards, or 25,600 tons, of putrescible matter annually to be disposed of—very nearly seventy tons daily.

From the diversity of plans used in different cities and the great variation in the cost of plant and expense of operation, it is obvious that the problem of disposing of garbage and refuse is distant from precise solution. According to prices of labor, materials and fuel, each city must estimate from its own standpoint. Unless transportation companies abate considerably from their present tariff, the refuse of our large cities has no margin of profit for fertilizing; and the cost of fuel probably forbids the saving of fats and production of gases. The cheapest method of cremation, therefore, is apparently the proper plan, by some apparatus like the London furnace, first drying and then consuming the stuff, and requiring little or no fuel when once well under way.

The running expenses would represent chiefly a fair interest on cost of plant, the labor of two men for each day and night shift, and the cost of gathering the refuse from house to house. Carefully prepared statistics indicate that twenty-five cents per capita annually would cover cost of carriage to two or three crematories located in the suburbs of San Francisco—say \$80,000; while under the present system each of the 60,000 families, paying twenty-five cents a month for removal to the dumps, or three dollars a year, the amount is \$180,000. The difference (\$100,000) would pay for the whole plant in one year, besides the operating expenses, and leave a large surplus, even if nothing were utilized. It is certain, however, that a large quantity of stuff might be saved, such as bottles, rags, and fragments of metals, worth much more than the cost of sorting over the mass.

A company organized to carry out an imperfectly outlined plan like the foregoing would not require a very large capital, and would relieve the city of the worst features of the present barbarous method. Once under way there would be time to devise improvements, for the purpose of saving useful products.

Besides, it is evident that the cost to householders for removing garbage is unnecessarily high. No franchise should be granted without providing for regulation of charges for service rendered.

There is no time now to dwell upon the sanitary aspect of the case. It is known that the refuse of a city abounds in disease germs, and in the neighborhood of the dumps the dried stuff furnishes a large quota of the atmospheric dust which people must breathe. Moreover, recent experiments of a New York physician (*Medical Record*, January 23, 1893) show that air exposed to moist exhalations from a sewer is liable to contain such microbes, for out of forty careful observations with suitable apparatus, they were found in one-half. My own investigations, recently made, show clearly an unduly large prevalence of diphtheria and scarlatina within half a mile of the San Francisco dumps for the last five years. Want of data restricted the study to these two diseases.

The Art of Living Two Hundred Years.¹

BY WILLIAM KINNAR.



VERY few people, it is safe to say, desire old age. Men and women harassed by trouble, or overpowered by sorrow, surrounded by disgrace or tortured by pain may long for death, but not for a hundred or two hundred years of human life. Old age is of two kinds. One, the calm passing of many years; the other, brought about by excesses either mental or physical. The latter is not within the province of this brief essay. Without good health and faculties, trained by sobriety and temperance in all things, both of mind and body, long life would be an intolerable tedium. To die would be indeed great gain in such a case. The possibility of living two hundred years in average good health seems to many a wild sort of scientific dream. So did crossing the Atlantic by steamships; so did conveying intelligence by electricity; so did all the many startling inventions of these latter days. Every

¹ From the North American Review.

week we read of people who have lived to be a hundred or a hundred and ten years old. Let us not be surprised at anything.

We cannot defy death. But we may, by searching, find certain secrets of nature and apply them to the renewal of the organs whose decay is constantly going on in the body. Anatomical experiment and investigation show that the chief characteristics of old age are deposits of earthy matter of a gelatinous and fibrinous character in the human system. Carbonate and phosphate of lime, mixed with other salts of a calcareous nature, have been found to furnish the greater part of these earthy deposits. As observation shows, man begins in a gelatinous condition; he ends in an osseous or bony one—soft in infancy, hard in old age. By gradual change in the long space of years, the ossification comes on; but after middle life is passed, a more marked development of the ossific character takes place. Of course these earthy deposits, which affect all the physical organs, naturally interfere with their functions. Partial ossification of the heart produces the imperfect circulation of the blood, which affects the aged. When the arteries are clogged with calcareous matter there is interference with the circulation, upon which nutrition depends. Without nutrition there is no repair of the body. Hence in his work, "The Physiology of Common Life," G. H. Lewes states that "if the repair were always identical with the waste, life would only then be terminated by accident, *never by old age*." Both Bichat and Baillie considered that the greater number of people past sixty suffer more or less from arterial ossification, which brings about obstructions in the proper and healthy circulation of the blood.

None of these things interfere with nutrition and circulation in early years. The reparation of the physical system, as every one ought to know, depends on this fine balance. In fact, the whole change is merely a slow, steady accumulation of calcareous deposits in the system. The physical organs cannot preserve the balance between waste and nutrition. This is what we call old age. Nutrition in the earlier years of life is perfectly performed. Repairs are at once promptly attended to by the young blood. To repair the waste of the body, so that the exquisite equipoise called perfect health may be maintained, and the decay and blockage which advances with age may be kept at bay, is to prolong our years. If this secret be known, why not hundreds of years of life? Keep the means of repair of the system always in good

working order, and you live, according to nature, in the highest, finest sense. Then, what are the means of checking these osseous and cartilaginous enemies of life?

The oxygen of the atmosphere is a most destructive element in many respects. Researches of a recent scientific character have shown that the origin of one of the sources of old age, namely, fibrinous and gelatinous matter, can be traced to the destructive action of atmospheric oxygen. Now, the relative proportions of oxygen and nitrogen in the air we constantly breathe are twenty-two of the former to seventy-eight of the latter. Oxygen is the more active, aggressive element of the two, though of much smaller bulk. For every other element except flourine, oxygen has an affinity, thus forming oxides. In the chemical changes constantly taking place in our bodies, oxygen plays the most important part by all odds. By oxidation, which is a constant waste or rust of life, the physical system is hourly destroyed, and then again built up by the reparation of the food we live upon. Albumen and fibrine exist in the blood, and are resolved into their component elements, carbon, hydrogen, nitrogen, oxygen, sulphur and phosphorus. By oxidation, the albumen is converted into fibrine, which nourishes the organs of our bodies. But in repairing their waste an excess of this substance accumulates in the blood vessels, causing their induration, and thus gradually lessening their calibre. Gelatine is an oxide of fibrine, as fibrine is an oxide of albumen. Oxidation causes these substances in part to be decomposed, and afterward eliminated through the kidneys. A constant struggle is daily going on in our bodies when in the most perfect health between accumulation and elimination. And these accumulations, becoming greater in old age than the power of elimination, produce the effects we term feeling one's age.

In order to extend and prolong life, how shall they be counteracted? Let us see. Seventy per cent. of the human body is water—nearly three-fourths. Not a single tissue is there in which water is not found as an ingredient. Certain salts are held in solution by this water, portions of which—notwithstanding the large quantity eliminated by the secretions—become more or less deposits in the body. When these become excessive and resist expulsion, they then cause the stiffness and dryness of old age. Entire blockage of the functions of the body is, then, a mere matter of time, and the refuse matter deposited in the blood, in its constant

passage through the system, stops the delicate and exquisite machinery which we call life. This is death. It has been proved by an analysis that human blood contains compounds of lime, magnesia and iron. In the blood itself are thus contained the earth salts. In early life they are thrown off. Age has not power to do it.

Hence, as blood is produced by assimilation of the food we eat, to this food we must look for the earthy accumulations which in time block up the system and bring on old age. It is thus seen that in the necessary elements of nutrition lurk the enemies of life, for food contains salts of a calcareous character. Does it then follow that man, by careful selection of his daily food, may prolong his life? In a measure, yes. Bathing, pure air to live and sleep in, exercise and other means of preserving health must be attended to, of course; but what we put into our mouths to make our blood is the important matter either in retaining health or prolonging life. Almost everything we eat contains more or less of these elements for destroying life by means of calcareous salts deposited by the all-nourishing blood. Careful selection, however, may enable us to avoid the worst of them.

Paradoxical as it may sound, certain foods which we put into our mouths to preserve our lives help at the same time to hurry us to the inevitable gate of the cemetery. Earth salts abound in the cereals, and bread itself, though seemingly the most innocent of edibles, greatly assists in the deposition of calcareous matter in our bodies. Nitrogenous food abounds in this element. Hence a diet made up of fruit principally is best for people advancing in years, for the reason that being deficient in nitrogen the ossific deposits so much to be dreaded are more likely to be suspended. Moderate eaters have in all cases a much better chance of long life than those addicted to excesses of the table. Blockages of the functions of the stomach are more usual to those who eat more than the stomach can utilize than to light eaters.

Mr. De Lacy Evans, who made many careful researches in these regions of science, comes to the conclusion that fruits, fish and poultry, and young mutton and veal contain less of the earthy salts than other articles of food, and are, therefore, best for people entering the vale of years. Beef and old mutton usually are overcharged with salts, and should be avoided. If one desires to prolong life, therefore, it seems that moderate eating and a diet containing a minimum amount of earthy particles is most suitable

to retard old age by preserving the system from functional blockages. Excessive action of atmospheric oxygen must be counteracted. Ossific matter deposited in the body must be dissolved as far as practicable. To produce this desired effect distilled water and diluted phosphoric acid are perhaps the most efficacious and the least harmless. Their combined chemical action retards old age.

The powerful solvent properties of distilled water are well known. As carbonate of lime exists in nearly all drinking water, the careful distillation eliminates this harmful element. As a beverage, distilled water is rapidly absorbed into the blood; it keeps soluble those salts already in the blood and facilitates their excretion, thus preventing their undue deposit. The daily use of distilled water is, after middle life, one of the most important means of preventing secretions and the derangement of health. As to diluted phosphoric acid, it is one of the most powerful influences known to science for shielding the human system from the inconveniences of old age. Daily use of it mixed with distilled water helps to retard the approach of senility. By its affinity for oxygen the fibrinous and gelatinous deposits previously alluded to are checked, and their expulsion from the system hastened. Waste of the tissues is believed to be preventable also by the use of hypophosphites.

Hence, to sum up: The most rational modes of keeping physical decay or deterioration at bay, and thus retarding the approach of old age, are avoiding all foods rich in the earth salts, using much fruit, especially juicy, uncooked apples, and by taking *daily* two or three tumblerfuls of distilled water with about ten or fifteen drops of diluted phosphoric acid in each glassful.

As some objector may say, "I would not take all this minute and daily trouble to live 200 years—better a short life and a merry one," I will only answer, Take your choice.

REV. T. T. MUNGER, D.D., says: "A good body well cared for and well used is not only on the side of virtue, but is one of its chief fortresses," the greatest of all helps towards chastity.

The Relative Merits of Land Quarantine and Cleanliness.¹

BY J. R. LAINE, M.D.,

Secretary of the State Board of Health of California.



THE authority vested in the State Board of Health by the codes and statutes relates to the collection of vital statistics and the manner of preventing the introduction of contagious diseases by rail. It is given a wide discretionary power in this direction, but it would be very difficult to present instances of successful efforts to prevent cholera from crossing State lines. To say that it can be done, and to argue the possibility of its accomplishment would be no more profitable than to say that it can not be done and to argue its impracticability. There are points where unsparing pains should be taken to prevent the entrance of the disease. Such efforts, even if everywhere directed with watchful and intelligent energy, must of necessity be defective. This is especially apparent where an absolute prevention is aimed at, for with but few exceptions, on our State lines, nothing but a relative quarantine is practicable. An absolute quarantine is next to an impossibility.

To argue the practicability of an absolute land quarantine it is necessary to indicate beyond doubt how we may control all character of animal life, either beneath the surface of the earth, on its surface, or in the air, and prevent them from crossing the line. It is also necessary to show our ability to prevent every atom of matter capable of carrying the germs of disease from being blown by the wind across the line. But little need be said to show the impracticability of an absolute land quarantine on our extended State lines. Many view such efforts with illy concealed contempt, yet they acknowledge the utility and efficiency of some attempt to limit the spread of contagious diseases by some kind of supervision and restraint which is termed relative quarantine, and which aims to do all that it is possible to do without building a wall around the State that nothing can pass. The national quarantine laws may cut no small figure on our State

¹ Read before the State Sanitary Convention at San Francisco, April 17, 1893.

borders, and may aid in a large degree in hindering the onward march of the destroyer, but it would be well not to place too much reliance on our ability to check it at the State line.

If the people become convinced that it is not only possible, but easy of accomplishment, they will argue against the necessity of personal and municipal cleanliness. There is a respectable contingent that base their views on history and ridicule quarantine.

They argue that such efforts have never successfully accomplished valuable results, and that they never can. No harm can come from uncovering the failures of the past. They can in no manner dishearten those who have the resolution to make the attempt, but they may show why our fathers were unsuccessful, and our own want of success may enlighten future generations, who may, perhaps, develop a "Jenner" to rob the stalking spectre of his power to slay. History is always quoted in opposition to progress. No advance in medicine or science but has had to run the gauntlet of history quoted against it. "What has never been never can be" appears a safe dictum, but the discoveries of the nineteenth century have often given it the lie.

When we now fail to overcome obstacles we attribute our failure to our lack of observation and knowledge. This may well apply to everything not dependent on nature's immutable laws. We should not discourage an attempt at quarantine by land; but our knowledge of what it has done, or failed to do in the past, will not justify dependence upon it alone. Whatever remains to be done we must, as intelligent beings, do ourselves. We must practice and preach cleanliness.

The doctrine is rapidly gaining ground that prevalent diarrhœas in cholera epidemics contain cholera germs, and that the dejecta of persons with choleraic diarrhœa are capable of transmitting a virulent cholera in another under the usual conditions necessary for their development.

If this be true we cannot effectually quarantine cholera unless we also quarantine diarrhœa. We are compelled to regard the diarrhœal affections prevailing at such times as mild forms of cholera and identical with it. If this view is well founded we must, on land, at least, trust altogether to sanitation to bring about an abatement of the scourge. The soil must be rendered sterile to the disease and patient investigation continued to seek a quicker means of rendering it harmless. We may quarantine

those who are in the throes of death while the persons with diarrhœa are spreading the seeds of the disease broadcast. This view is not proven, but it bears by analogy with other contagious diseases an almost convincing probability. All practitioners of large experience can recall walking cases of typhoid fever in whom the dejecta were as infectious as in those who were in bed.

Our means of defense, outside of quarantine and personal hygiene, consists in the purification of the soil, the water and the air. The boards of health of towns and counties should be supported with great liberality, and health officers selected for their prudence and fearlessness. At this particular juncture a capable and dauntless health officer is the most desirable official in a community. Not one of us but can point out plague spots near our homes that only need the decisive action of a fearless health officer to remove. No alarm need be felt, no panic precipitated, but the medical profession as a unit should explain the necessity of energetic action of a material character to the influential people in their communities, and point out what should be done to insure safety to the people. These measures should be discussed and undertaken as business enterprises, for no greater calamity can befall the industrial and business interests of a country, State or community than the presence of a death-dealing epidemic. It becomes necessary to show that if certain things are done we may feel reasonably secure. As to the rules of life and conduct to be observed during the prevalence of an epidemic it is not the province of this paper to discuss. But it is well to show that pure water, pure air and pure soil are necessary to the development of a high order of physical life, and that during a cholera season they are almost the essential conditions of our existence.

THE *Utica Herald* prints the following comprehensive and exhaustive treatise on the evil effects of tobacco: "Thomas Delany, of Albany, aged 19, thought nothing of smoking five or or six packages of cigarettes a day. His funeral took place recently."

On the Care of the Hands.¹

BY W. F. MORGAN, M.D.,
Leavenworth, Kan.



WISH to offer some suggestions upon the care of the hands, and to point to some simple facts that seem to be too generally ignored. Soap and civilization are said to be co-extensive, and each has its compensations and its disadvantages. The necessity for a frequent use of soap removes nature's protective cutaneous oil, and hence the cuticle becomes too dry, brittle and chapped. The problem seems to be to restore this naturally soft, pliant and oily condition of the skin.

Some, either by the natural conditions—as shown by the hair as well as by the skin—or by virtue of their occupation (*e. g.*, butchers, chandlers, etc.), seem exempt from a liability to rough, dry and chapped conditions of the hands. Having experimented in the past thirty years with various methods, I would submit the following treatment as the most satisfactory:

(1) If the epidermis be of unequal thickness and rough, it may be rubbed thoroughly with wet corn-meal, or fine sandpaper. It will not usually be necessary to repeat this part of the treatment.

(2) If the nails are brittle, use potable waters which contain the necessary mineral constituents, which are absent from pure rain water. These constituents may also be supplied to the system, though not so well, by certain tissue-remedies, according to the indication of each case.

(3) Protection of the hands by suitable covering.

(4) Restore to the skin the natural oil which has been more or less removed by the use of soap, and this is best done after thoroughly washing and drying, by the application of a little nice soap-lather mixed with a few drops of glycerine, as a permanent dressing, and well rubbed in. This process it may be necessary to repeat, especially in very cold weather, every day, and when convenient, the best time to make the application is at bed time.

¹ From the N. Y. Medical Times.

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Misrepresenting The Sanitary Condition of a House.

EDITOR OF THE ANNALS OF HYGIENE:

ABOUT the 5th of July I bought a house in a central location in this city with the assurance that I should not have to spend over fifty dollars on it, etc.; that the plumbing was first class, having been put in by well-known plumbers on Chestnut Street. The only trouble, I was informed, was that the sewer was not low enough to properly carry off the drainage from the cellar water closet, and that, therefore, *that* fixture had been removed. My first inquiry was directed toward seeing why the sewer was so placed. At the Survey Bureau I was informed that it was laid nine feet at Twentieth Street and ten feet at Twenty-first Street. This satisfied me that there must be some other explanation of the trouble with the drain, as the sewer was certainly several feet below the bottom of the cellar. I then had the back yard dug up to connect the rain spout, when I discovered that the house drainage had formerly been carried by a terra cotta pipe to a well in the yard, and that when the use of the well was discontinued, the same drain was carried through under the kitchen floor and connected with the sewer. The terra cotta pipes extended up several lengths inside the house wall. Three distinct leaks were found, and the sewage of the whole house was being daily discharged at and about the foundations of the house immediately by the kitchen range; but, worse than all this, when we came to uncover the pipes in the third floor, which I now decided to do, we discovered three joints in the iron pipe system which had no semblance of lead, nor even cement in them. Now I am informed that the former occupants have been sick nearly ever since they lived in this house, and I tremble when I think what might have happened to my family had I relied on the reputation of the plumbers and moved into the house without uncovering the work. You may say that terra cotta pipes under ground are always liable to be broken, but is there any excuse for using terra cotta inside the house walls, and can there be any possible justification

for leaving *and covering up* three uncaulked joints on the main sewage drain pipe simply because they were a little difficult to get at? What, in your opinion, should be the responsibility and measure of damages for such a piece of work?

N. B. C.

We thank the writer of this letter, who is a very prominent and influential citizen of Philadelphia, for furnishing us with the text for a few remarks upon a subject than which there is none more important in the whole domain of sociology. Of all crimes, to our way of thinking, there is none calling for such swift and severe penalty as a misrepresentation that is calculated to injure health or destroy life. It is, as our correspondent truly suggests, appalling, when we reflect upon the frightful consequences that might have ensued had he not had the prudent forethought to do what he did.

That the world is not as it ought to be, in many respects, is only too evident to one who thinks, but, of course, a universal reformation is impracticable. In respect to the question of the sanitary condition of houses for rent or for sale, however, it is high time that we should have some salutary legislation. To answer our correspondent specifically, we would say that, in our opinion, the penalty for misrepresenting the sanitary condition of a house, should be, at least, equal to that of homicide.

Too Late.

It is one of the attributes of a good teacher that he knows how to say things in a way to make them remembered. During my second year at the Jefferson Medical College in Philadelphia, writes a physician in the *New York World*, I had a classmate whom it would not be uncharitable to call a dullard. One of the professors was in the habit of taking the boys unawares and quizzing them. He said to this fellow one day, "How much is a dose of——?" giving the technical name of croton oil. "A teaspoonful," was the ready reply. The professor made no comment, and the fellow soon realized that he had made a mistake. After a quarter of an hour he said: "Professor, I want to change my answer to that question." "It's too late, Mr. ——," responded the professor, looking at his watch. "Your patient's been dead fourteen minutes."—*Memphis Medical Monthly*.



The Hygiene of the Teeth.

All decay of the teeth begins from the outside, no such thing as internal decay having ever been demonstrated; hence, if the surfaces could be kept absolutely clean, no decay could take place, however poor the texture of the teeth. This is, of course, impossible, but much in this direction can be attained by attention to hygienic rules. Parents often ask their dentists and medical attendants: "When ought teeth to be cleaned?" The answer assuredly is: "As soon as there are teeth." A very small tooth-brush charged with some precipitated chalk flavored with an aromatic drug to make it pleasant, is perhaps the best means.—*The Lancet*.

An Unsuspected Danger.

At the late meeting of the Iowa State Board of Health, Dr. F. Becker made a statement of a case of infectious disease that suggests a source of danger not often thought of. He said that in the early part of last January a case of scarlet fever occurred two miles west of Oelwein, in Fayette County. The subject was a little girl between two and three years old, and death resulted. Eight or nine days before her attack a peddler visited the family. The little girl sat upon his knee and perhaps was standing by when he exhibited his goods.

No other probable source of infection is known, and while it would be hard to demonstrate that such an exposure had taken place by that visit as to cause the outbreak of the disease, yet its occurrence so soon after this visit is very suggestive. Indeed, it would not be strange if infectious diseases are not oftener than we suspect distributed by these itinerant venders, who go through communities from house to house, from infected into healthy homes, without the means and often without the disposition to disinfect their person, clothing or wares. It would be well for these peripatetic salesmen to be interviewed in the barn or the orchard, or some place out of the dwelling house.

Stomach Milk Diet.

Dr. W. E. McNutt, of San Francisco, says that in ordering a milk diet the physician is often informed that the patient cannot tolerate milk in any form. Of course there are individuals who cannot take milk, where the hydrochloric acid is greatly deficient, or where lactic and butyric fermentation exists, as in many cases of cancer or dilatation of the stomach. In a large number of cases where milk has disagreed it will be found that the patient drank it in large quantities at a time. In all these cases milk should be given a fair trial by being slowly sipped. Where milk disagrees there are various methods of preparing it. That which has proved most satisfactory in my hands is to add about one-half teaspoonful of salt and two teaspoonsful of malted milk to one-half pint of milk, either cold or warm, as the patient pleases. This is to be constantly stirred, and taken in teaspoonful doses. Many patients who have never been able to take milk will not only tolerate this preparation, but become delighted with their new diet.

Points in Railway Hygiene.

The greater strength of the sleeping and parlor cars render them much safer to travel in than ordinary cars. Why, then, in the interests of the public—of human life, should not railroad companies be compelled to use only such cars for carrying passengers which are constructed on the same principal—long, with heavy timbers for the frame work, and well-constructed and well-braced vestibules? The cars need not be of course expensively finished, but that plan and weight in construction should be used which would afford the greatest safety from collisions and other accidents. It is somewhat strange that there has not long ago been legislation in this behalf.

The sleeping coffins in railway cars is another thing for which legislation is required. A common low lodging house, in some cities, which did not provide more cubic space per head, and which boxed up its lodgers in such bunks as are provided even in the best sleeping cars, would be suppressed as a nuisance dangerous to the public health. It is surprising that they are patronized as largely as they are; although we know individuals who prefer to spend the night in an ordinary car when not too crowded, and

who would do so were they required to pay extra for the privileges of a "sleeper." The ordinary unbunked car is always much better ventilated; the doors are frequently open during the night, and there is nothing to impede the free circulation of fresh air, which usually rushes in through the open doors and through the car, while it is free from the curtains and bedding, laden with human breath and other excrement, found in the sleeping cars. All cars are, of course, most imperfectly ventilated.

—*Sanitary Inspector.*

The Influence of Occupation on Health.

Sunlight and ventilation are of the greatest importance in workshops and offices, particularly where the young men are employed. Patients make better and more rapid recoveries in well-lighted hospitals; and very serious cases are generally placed on the sunny side of such buildings. If, therefore, persons are more likely to regain health in such apartments, we may fairly conclude that health will be better preserved in a large, well-ventilated workshop, or office. Spacious, airy and well-lighted offices and work rooms for clerks, compositors, tailors, dressmakers, and others, would prevent a large amount of chronic disease. The sedentary occupations followed by bookkeepers, milliners, seamstresses, tailors, shoemakers and others, are often most unfavorable to health, because the sitting posture is generally combined with an inclination forwards, so as to compress the chest and stomach.

Abundance of healthful recreation in the open air is the best corrective of the injurious consequences of sedentary employments.

The following list, from authentic sources, gives the general average of life among certain classes:

Of 100 Clergymen	42	attained the age of 70 yrs. and upwards.
" Farmers	40	" " " "
" Commercial Men	35	" " " "
" Military Men	33	" " " "
" Lawyers	29	" " " "
" Artists	28	" " " "
" Teachers	27	" " " "
" Physicians	24	" " " "

The first half in the above list, with the exception of the clergymen, are necessarily much exposed to the air, and take physical exercise ; but the other half, with the exception of the physicians, are chiefly confined in-doors, engaged in sedentary occupations. Literary pursuits are generally favorable to longevity. Physicians are short-lived, from their irregular lives, frequent exposure and the excitements attendant upon their practice. The best possible condition favorable to longevity would be a certain number of hours devoted to riding, or out-of-door exercise. The circumstances which render occupations unhealthy are, deficiency of daylight and pure air ; a bad posture of the body during employment ; and the inhalation of poisonous substances, or dust, producing irritation of the lungs.

The Height of Man.

A French statistician has been studying the average heights of men at different periods of the world's history, and has reached some alarming conclusions.

The recorded facts extend over nearly three centuries. It is found that in 1610 the average height of men in Europe was nearly 6 feet, 6 inches. In 1790 it was 5 feet, 6 inches. In 1820 it was 5 feet, 5 inches and a fraction. At the present time it is 5 feet, $3\frac{3}{4}$ inches. It is easy to deduct from these figures a rate of regular and gradual decline in human stature, and then apply this, working backward and forward, to the past and to the future.

By this calculation it is determined that the stature of the first men attained the surprising average of 16 feet, 9 inches. The race had already deteriorated in the days of Og, and Goliath was quite a degenerate offspring of the giants.

Coming down to later time, we find that at the beginning of our era the average height of man was 9 feet, and in the time of Charlemagne it was 8 feet, 8 inches.

But the most astonishing result of this man's study comes from the application of the same law of diminution. It is conclusively shown that in 4000 A.D. the height of the average man will be but 15 inches, and in a few thousand years more the end of the world will come, for men will get so short that there will be nothing left of them.—*Buffalo Express*.

"Black Death" Following Cholera.

An official report of the Governor-General of Turkestan, which has recently been published in St. Petersburg, states that that province has been severely visited by an epidemic of "black death," which followed on the footsteps of cholera. It appeared suddenly at Askabad, and in six days killed 1303 persons in a population of 30,000. "Black death" has long been known in Western Asia as a scourge more deadly than cholera or the plague. It comes suddenly, sweeping over a whole district like a pestilential simoon, striking down animals as well as men, and vanishes as suddenly as it came, before there is time to ascertain its nature or its mode of diffusion. The visit here referred to was no exception to this rule. After raging in Askabad for six days, the epidemic ceased, leaving no trace of its presence but the corpses of its victims. These putrefied so rapidly that no proper post-mortem examination could be made. The Governor-General gives some details as to the symptoms and course of the disease, which, though interesting as far as they go, do not throw much light on its pathology. The attack begins with rigors of intense severity, the patient shivering literally from head to foot; the rigors occur every five minutes for about an hour. Next an unendurable feeling of heat is complained of; the arteries become tense and the pulse more and more rapid, while the temperature steadily rises. Unfortunately no thermometric readings or other precise data are given. Neither diarrhœa nor vomiting has been observed. Convulsions alternate with syncopal attacks, and the patients suffer intense pain. Suddenly the extremities become stiff and cold, and in from ten to twenty minutes the patient sinks into a comatose condition, which speedily ends in death. Immediately after he has ceased to breathe large black bullæ form on the body, and quickly spread over its surface. Decomposition takes place in a few minutes.—*British Medical Journal*.

Sleeping Alone.

"I have been looking at furnished houses," said a woman recently, "and I am surprised to find how much the use of single beds has increased, at least among New Yorkers. I was curious enough to inquire about the matter at a furniture store, and the dealer told me that in offering suites, particularly the high-priced ones, the choice was often given of two single or one double bed-

stead," which would seem to indicate that the wealthy class, which is oftenest abroad, is bringing home this practice. It is beginning to be understood, however, by a growing number of persons, that to sleep alone appreciably contributes to the rest and health. The system undergoes electrical changes during the night's sleep, and where persons lodge together night after night under the same bedding these changes mutually react with appreciable results.

The London *Lancet* called attention not long ago to the habit of dual sleeping, saying that there is nothing that will so derange the nervous system of a person who is eliminative in nervous force as to lie all night in bed with another who is absorbent of nervous force. The latter will sleep soundly and will rise refreshed, while the former will toss restlessly, and will wake in the morning weary, peevish and discouraged. No two persons, no matter who they are, ought habitually to sleep together. The one will thrive, the other lose. An aged person and a child should not be bed-mates. Great as is the pleasure to grandma to have her "little comfort" with her at night, it is one which the wise, as well as the fond, relative will forego for the child's sake.

A case recently came to the writer's knowledge of two sisters 15 and 17 years old. The younger was a splendid specimen of young womanhood, robust, active and merry, while the elder, though not ill in any definite way, was thin, tired out quickly, and fretted over trifles like a nervous old woman. These conditions finally came to be accepted, and probably would have continued indefinitely if an English relative, a physician, had not made the family a visit. His sharp eyes noted the morning lassitude of the elder girl and the corresponding freshness of her sister at breakfast and he drew his conclusions. An inquiry of the mother secured the knowledge that they not only slept in the same bed, but said she, "Elsie's (the elder) devotion to her is such that for years she has only gone to sleep when she could hold Mabel close in her arms."

The doctor fairly snorted at this sentiment, and in the end persuaded the sisters to sleep apart. Two pretty brass bedsteads side by side offered propinquity and comfort, but prevented contact, with the result that in six months' time Elsie showed a marked improvement in her general health and has become in eighteen months a happy, good-tempered young woman, with considerably increase in avoirdupois. In this case, at least, the improvement dates from the moment of separate beds.—*Exchange*.

The Pied Piper of Hamelin.

It might be a wise expenditure of money for some benevolent person interested in sanitation to present to every municipal corporation in the kingdom a copy of Browning's delightful poem, called "The Pied Piper of Hamelin," on the understanding, of course, that every member of the corporation should read, mark, learn, and inwardly digest the same. The story is, perhaps, not so well known as it ought to be. Hamelin town, in Brunswick, some 500 years ago (the date is Browning's), was infested with rats, and the mayor and corporation were at their wits' end to know how to get rid of the plague. The pied piper offered his services, for which he was to be rewarded with 1000 guilders; and he piped to such purpose—so cunningly and enticingly—that all the rats in the town (save one) followed him to the river Weser, wherein all plunged and perished. Great joy naturally in the town of Hamelin. But, as naturally, the Piper wanted to be paid his 1000 guilders. Here, however, the mayor and corporations grew stingy; their business was done, they thought, and they would be troubled no more; but to get rid of the pestilent fellow they offered him fifty. Then comes the tragedy of the story. They had treated their deliverer shabbily; they had put him in a passion, and they found him pipe to another fashion. Again he piped, so sweetly and persuasively, that all the children in the town came flocking out, and ran merrily after the wonderful music with shouting and laughter; and they followed their leader to the side of a mountain, which opened and swallowed them all up, and they were never heard of more—in Hamelin; and the parents in that ill-fated city were left to mourn.

But it isn't true? We are not so sure of that. It is certainly in print; and if it weren't true, how could a poet like Robert Browning have taken the trouble to write out the story in charming verse? For our part we believe it to be perfectly true—if not in the letter, certainly in the spirit. When Browning wrote it, do you not think he had in view those municipalities that grudge the expense of paying to get rid of nuisances? There are plenty among ourselves who still act the part of the mayor and corporation of Hamelin. Clearly the meaning of the poem is that if you are mean enough to grudge the necessary expenditure for ridding your town of destructive pests, then you will have to pay for your sordid economy in the

loss of your dearest. You will see your children pass away before your eyes, and you will be utterly unable to stop them or to recall them. You have to pay the piper somehow; if not in money, then in some far more costly and tragical fashion. Bacilli are more troublesome and more destructive than even rats, because they destroy the most valuable of all property; and they cannot easily be got rid of without the spending of money. Disease is the costliest of all conditions for a town; while the expenditure on sanitation is the wisest economy. The shade of Browning will doubtless forgive us if we have in any way misread the impressive lesson taught by his "Pied Piper of Hamelin."—*The London Sanitary Record*.

Resistance to Cold.

The death of a centenarian Italian in a Norfolk town the other day, whose chequered life-history included service in Napoleon's "Grande Armée," during the disastrous Russian campaign of 1812, recalls attention to the fact that of all that host the Neapolitan contingent, 10,000 strong, withstood the cold and privations much better than the other divisions, recruited as these were from Northwestern and Central Europe. So interesting and unexpected was this phenomenon, put on record by Baron Larrey, head of Napoleon's medical staff, that the physiologists and hygienists of the time hazarded many explanations of it—explanations revived and checked during the Crimean campaign forty years ago, when again the Italian regiments of the allied forces were found to suffer less from the Russian winter than their French or even British comrades. The view taken of the fact was this: that the Italians, born and reared in the sunny south, retained so much "caloric" in their systems that their supply of it continued long after their fellow soldiers from less favored climes had used up theirs. In support of this the experience of other Italians was invoked who, as teachers or artists, had settled in English or Scottish educational centres, and whose power of weathering the first northern winter was much greater than during the second or third, by which time, it was contended, their supply of "caloric" was exhausted, and they were fain to have recourse to the creature comforts for which at first they had a positive repugnance. Australian colonists and Anglo-Indian officers, on their return to the mother country, cited their experience in a similar sense, and

Claude Bernard's "Chaleur Animale" (1876) came afterward to translate those popular inductions into scientific language. No doubt during those Russian campaigns the Italian troops, new to such a climate and to such winters, felt the keenly oxygenated air as a stimulating, restorative influence, rather than as a depressing one, and all through the several weeks of their subjection to the novel conditions the "systemic response" to these declared itself in a heat production considerably in excess of the heat loss. The question of course arises—could that "systemic response" continue at its maximum of force the second winter? Experience answered in the negative, and the testimony of Italian civilians resident in the British Isles, as well as of the Australians and Anglo-Indians aforesaid, points to the same conclusion. One element in the explanation of the phenomenon, however, must not be overlooked, and that is the greater temperance of the southern as compared with the northern European. To the former—and this was especially marked in the disastrous retreat from Moscow—the abuse, or even the sparing use, of alcohol was all but unknown. This abstinence put the Italian at a mighty advantage over the northern soldiery who, as Sir Walter Scott has placed on vivid record, flew to cognac or vodki whenever they could get at it, and considered themselves happy if they could purchase "some hours of insensibility" by intoxicating liquors. Then, again, Italians in general, and Neapolitans in particular, inured to the scantiest meals of macaroni and salad, felt the starvation diet of the forced marches much less than their French or Teutonic comrades. The same must also be said in the matter of clothing—the Neapolitans, even in abnormally cold winters, contenting themselves with an artificial warmth in raiment and fuel much below that to which the northern races are accustomed.

Death in the Well.

Dr. J. H. Kellogg thus writes in *Modern Medicine*: It was once the fashion to ascribe all cases of sickness and death, from causes not readily discernible, to special acts of Providence; it is now, however, well recognized that sickness is the result of the action of natural laws and of material causes, which, in the great majority of cases, as regards acute illness at any rate, are preventable.

At a recent meeting of the Michigan State Board of Health, Prof. Fall, of Albion, Mich., called attention to one mode in which what in times past might be termed strange dispensations of Providence, are being very effectually produced in the southern part of this State. According to Prof. Fall, it is quite a prevailing custom to secure the drainage of cesspools and other receptacles of filthy water, by boring down through the underlying strata of clay or rock until an underground watercourse is reached, by this means securing permanent and very satisfactory drainage. The objection to this plan, however, is to be found in the fact, which, it would seem, ought to be readily recognized, that this is the most effective manner possible of contaminating the water supply for an extensive district. It may be supposed that at the present time every intelligent person knows enough about sanitary matters to understand perfectly well the danger of the contamination of wells which are fed by surface drainage; but driven or bored wells, which penetrate an impervious strata of rock or clay, are generally supposed to be a safe and reliable source of water supply. This new device for the disposal of filthy water is, however, a most efficient method of contaminating the underground water supply and spreading disease and death to an unknown distance through the conveyance of infectious matter by these underground currents to distant parts. Dr. Baker called attention to the fact that the water supply of Jacksonville, Fla., is supposed to come through an underground water course from the adjoining State of Georgia. Numerous cases are on record in which disease germs have been carried for many miles in these underground water-courses.

The writer became acquainted with a case several years ago, in which a man disposed of a great accumulation of barnyard litter by throwing it into a well for which he had no further use, on account of having recently had constructed a bored well of great depth. Within a short time afterward a neighbor, who lived across the road and in the direction of the dip of the surface and of the underlying strata, discovered that something was the matter with his well; complaint was made to the health officer, who submitted a sample to the writer for examination. The water was found to be full of organic impurities and swarming with germs, and had a decided barnyard odor, showing clearly the origin of the impurities.

Unthinking people may suppose that filth which disappears

from the surface of the earth goes out of existence, but this is by no means the case ; germs possess great vitality, and may be conveyed bodily in water-courses for a very great distance. When it is allowed to percolate through the soil, impure water is gradually purified by a process of nitrification, although the soil may in time become so saturated with filth that its properties for purification may be exhausted ; but when filth passes directly by bored channels into the underground water-courses, there is no bar whatever against the wide dissemination of the agents of disease and death which are always to be found in impure water.

Hints to Prevent the Spread of Consumption.

Wm. R. Huggard, of Davos Platz, Switzerland, sends the following : All cases of tubercular disease of the lungs ("consumption") take origin directly or indirectly from other cases. This is now an established fact. Infection, however, is easily provided against if certain simple precautions are taken.

The chief modes of infection are :

(1) *By inhaling dried and pulverized expectoration.*

This is apt to occur when an ordinary pocket-handkerchief is used by a tubercular person for expectoration. When such a handkerchief is opened, the dried expectoration is likely to be pulverized and diffused through the air. Thus it may be inhaled by others, as well as by the patient himself, who is likely to suffer from drawing disease-germs into portions of lung previously unaffected.

Another source of pulverized expectoration is the habit of spitting on the ground. The expectoration becomes mixed with dust, and then is easily carried into the air. This habit, therefore, is not merely offensive, but dangerous.

(2) *By using spoons, cups and other articles of the kind which have not been properly washed after having been used by tubercular persons.*

(3) *By kissing.*

This source of infection is especially to be guarded against in the case of children.

Self-infection may occur, in addition to the ways mentioned, *by swallowing the expectoration.* This habit is likely to lead

sooner or later to infection of the intestines with tubercular disease.

Knowing the channels of infection, we can easily take effective precautions.

The sputum must be destroyed, and must not be allowed to become dry.

A spitting-cup or flask containing just enough disinfectant solution to cover the bottom of the vessel should always be used for the expectoration. Out of doors a pocket spitting-flask, such as Dettweiler's, should be employed.

Pieces of linen or calico about ten inches square may also be carried. These should be used only in cases of absolute necessity, and should be burnt as soon as possible afterward. No piece should be used more than once.

Bedrooms that have been occupied by tubercular patients *should be thoroughly disinfected* before they are occupied by other persons, and a declaration or assurance on the point should always be demanded.

If the previous occupant of the room never allowed the furniture, hangings, or carpets of the room to be contaminated with the sputum, there would be little need for this precaution. But as people, ordinarily of cleanly personal habits, sometimes show a surprising amount of ignorance or carelessness in this respect, the following points should be insisted on :

(1) Carpets, curtains and bed-coverings should have been exposed to superheated steam under high pressure.

(2) The floor and walls of the room should have been properly disinfected. (Rubbing with new bread, followed by the application of corrosive-sublimate solution, is probably the most effective practical method.)

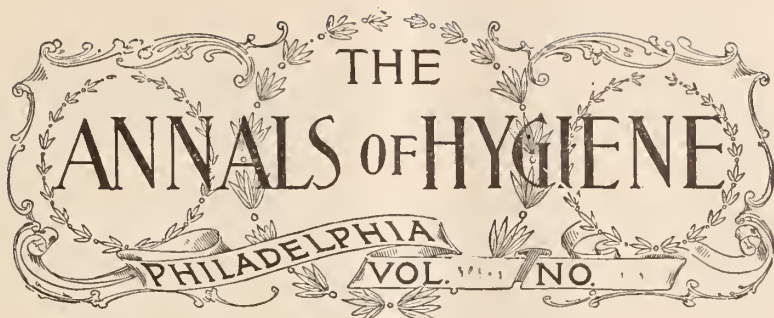
There is no danger of infection from the breath of a tubercular patient. The sole danger of social intercourse arises from neglect of the precautions described.

Fresh air is of the highest importance for tubercular persons. Hot and stuffy rooms have an evil influence over the disease. Except in special circumstances, the bedroom window should be kept open by night as well as by day.

Prevention of Disease and Death.

Life underwriters are particularly interested in the vital statistics of the country, for the reason that the mortality experience of the companies has an important bearing upon the cost of insurance, and to obtain a favorable mortality rate each year is an end eagerly desired. Theoretically, boards of health accomplish just that result, but there are not a few who affect to believe that practically they do not do so. With a view of getting some light on that matter, we have been examining some of the results accomplished by the Michigan State Board—one of the best in this country—kindly furnished us by Dr. Baker, the secretary, all illustrative of the results accomplished by the board in the control of those two dreaded diseases of childhood, diphtheria and scarlet fever. The following statistics are of interest: In 1889 the average number of cases per outbreak where isolation and disinfection were neglected, was 11.66, and the average number of deaths, 2.63. On the other hand, in localities where the directions of the board as to isolation and disinfection were strictly enforced, the average number of cases was 1.56, and the average deaths 0.22—a marked difference. The similar record for scarlet fever in the year 1888 shows 11.87 deaths per outbreak, with an average of .54 deaths where restrictions were not enforced, while the average per outbreak was but 2.22, and deaths .08 where isolation and disinfection were enforced.

The board of health was organized in 1874, and a comparative mortality rate in the State before and after its establishment is of interest as illustrating the effects of restrictive measures. For the five years, 1869-73, before the board was established, the deaths from scarlet fever were 4.85 per 10,000 inhabitants, while during the fourteen years, 1874-87, the deaths per 10,000 were but 2.45. The deaths per 10,000 inhabitants from smallpox for the same periods were before the employment of restrictive measures .85, and after .19. In 1879 the board undertook the restriction of typhoid fever, and with results which, while not quite so marked, were sufficiently so to demonstrate the value of such measures. Thus from 1869-78, that is before any restrictions were put upon the disease, there were 3.77 deaths per 10,000 inhabitants, while from 1879-89, representing the period when efforts were made to restrict it, the deaths were 3.08. Not less than 2500 deaths occur in Michigan each year from this disease, and it is claimed that a large part of this mortality can and ought to be prevented.



COMMUNICATIONS.

Lectures on Hygiene.

BY SENECA EGBERT, A.M., M.D.,
Lecturer on Hygiene at the Drexel Institute.



LECTURE III.

BEFORE considering the means by which the necessary quantity of fresh air may be supplied to inhabited apartments, it will be advisable to inquire whether the size of the apartments affect the problem. We have already shown that 3000 cubic feet of fresh air per hour per individual is necessary in order to maintain our standard of purity, and it will at once be evident that the smaller the room the more frequently will the air therein have to be completely changed if the required supply of out-of-door air be delivered. But the more frequently the air is changed the greater will be the liability to the production of uncomfortable or injurious draughts, especially if the air be not suitably breathed at all times; moreover, the smaller the room the less the likelihood of properly distributing the incoming air, and the greater the chance of the inmates being in the increased currents between the inlets and outlets. Experiments and experience show that with the most perfect mechanical means the air of an apartment may possibly be changed as often as six times an hour without perceptible draughts, but that under ordinary conditions of ventilation and heating a rate of change equal to three times per

hour is about all that can reasonably be attempted. Consequently the cubic space per individual should be from 1000 to 1200 cubic feet, with an even greater allowance for sick rooms and hospitals.

Again, the floor space must be considered, because it must always be remembered that the difficulty of securing equable heating and ventilation increases with the height of the room beyond a certain limit, and that with the sick especially a certain amount of floor space is necessary both for the separation of patients and for convenience of attendance. Here again we learn from experience that the minimum of floor space should not be less than one-twelfth of the cubic space; that is, the ceilings of



FIG. 1.—Fixed cowl for producing down current by perflation.

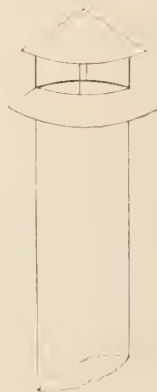
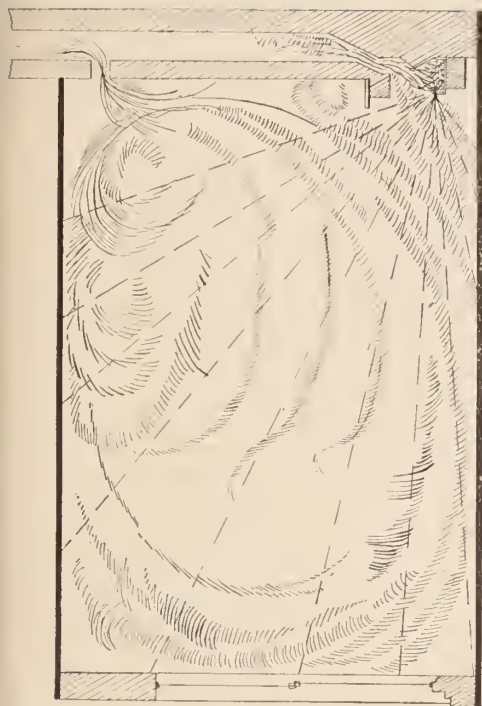


FIG. 2.—Fixed cowl for producing up current by perflation.

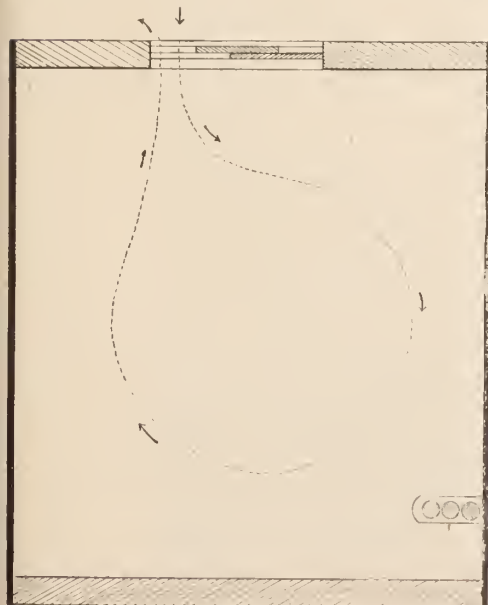
all apartments intended for continuous rather than temporary occupation should not be over twelve feet high. These restrictions of cubic and floor space do not, of course, necessarily apply to such rooms as are to be occupied by a number of persons for only a comparatively limited time, such as churches, theatres, etc., from which the impurities can be flushed out each time after use and in which it is especially impracticable to allot to each person the above floor area. However, even in these assembly rooms, pains must be taken to keep the air pure within reasonable bounds by whatever means of ventilation may be necessary; while for school rooms there must be watchful care that the pupils are not overcrowded and that they have a full supply of properly warmed air.



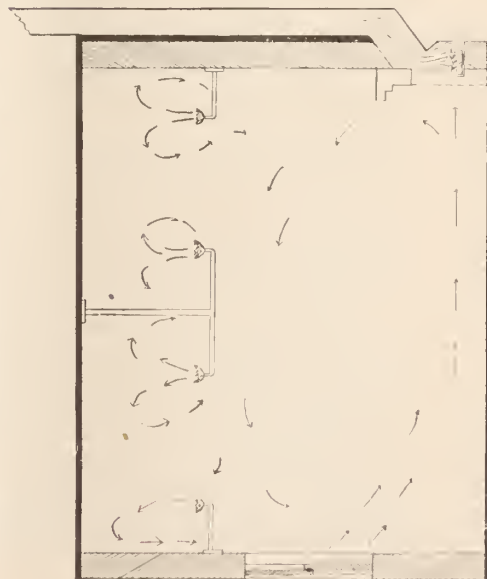
Currents in room heated by an open grate and with outlet above its chimney.



Currents in room heated by patent ventilating grate.



Current in room with only one opening and heating apparatus on opposite side of room.



Currents in room lighted by gas and heated from open grate.

FIG. 3.—Diagrams showing actual currents of air under various conditions.

In addition to the above considerations, any correct system of ventilation must take into account the source of the air supplied, the distribution and the heating or cooling of the air when necessary.

It goes without saying that the air supplied to any house should be pure out-door air, and that pure air can only come from a pure source, and yet it is a common thing, especially where hot-air furnaces are used, to find the air supply drawn from dirty cellars or from closed areas where the atmosphere is stagnant and full of impurities. All inlets should be well above the level of the ground and located where the air is free from contamination and constantly changing, and where conduits leading from them to the heating or other ventilating apparatus may be frequently cleaned. It is well to have them covered with gratings or nettings to prevent objects from being thrust into them, and in extreme cases in towns and cities it may even be advisable to filter the air through coarse cloth to free it from dust, products of combustion and other impurities. Screens of jute cloth at University College, Dundee, stretched on frames seventeen feet long by four feet wide, collected two and one-half pounds of dirt in seven weeks.

One of the most difficult problems in ventilation is to secure a uniform distribution of pure air through the rooms, and to remove the impure air as fast as the pure is supplied, thus preventing its mixing with the latter. Certain circumstances always make the question complicated: the size and number of inlets and outlets, the rate and direction of motion, and the forces acting to produce it must always be subject to constant change, and thus constantly alter the result. In fact, it is practically impossible to devise a plan that will satisfy all conditions at all times, and the best that can be done will be to select that one which will give the greatest efficiency and most satisfactory results under all ordinary circumstances.

Perhaps it will be well to determine here the forces which, acting singly or together, produce what is termed *natural ventilation*, and which also act to a greater or less extent in any system of *artificial ventilation*, though in this latter there are added to them other forces set in action by man. These three forces of natural ventilation are diffusion, winds, and the difference in weight of masses of air of unequal temperature. As the force of diffusion is constantly acting between all gases in contact, and that differ

in density, there is a constant interchange between the outer and in-door air, through not only the many openings in all buildings, but even through brick and stone. This diffusion is considerable, but it has the disadvantages that it is not sufficient in itself for any system of ventilation, that papering and plastering of walls greatly reduce it, and that it does not remove solid organic impurities, even though they be light and volatile.

Winds are very efficient factors in ventilation, and it is always well to take advantage of them, though it is not wise to rely

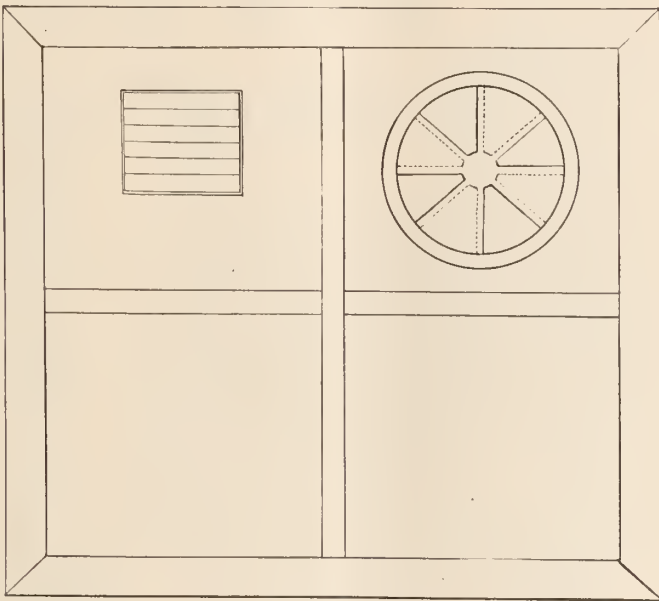


FIG. 4.—Window frame with two ventilators.

entirely upon them in any system, either of propulsion or extraction. A very gentle breeze passing freely through an apartment will not only change the air therein many times in the course of an hour, but also sweep out many solid impurities. So, also, winds blowing against inlet openings force large quantities of air through them, and advantage may be taken of this perflating action by arranging funnels, or cowls, so that the openings will always be directed towards the wind, and the air thus driven into the house. On the other hand, wind blowing *across* the end of a tube creates a partial vacuum therein, and a consequent current

through it, as is shown by the strong draught up an unused chimney on a windy day. So by using cowls that favor up-currents upon outlet tubes we may make use of this aspiratory power of the wind, especially in the removal of air from such places as cellars, holds of vessels, etc., where it is likely to be colder than the surrounding atmosphere.

The great objection to the use of the wind in ventilation,

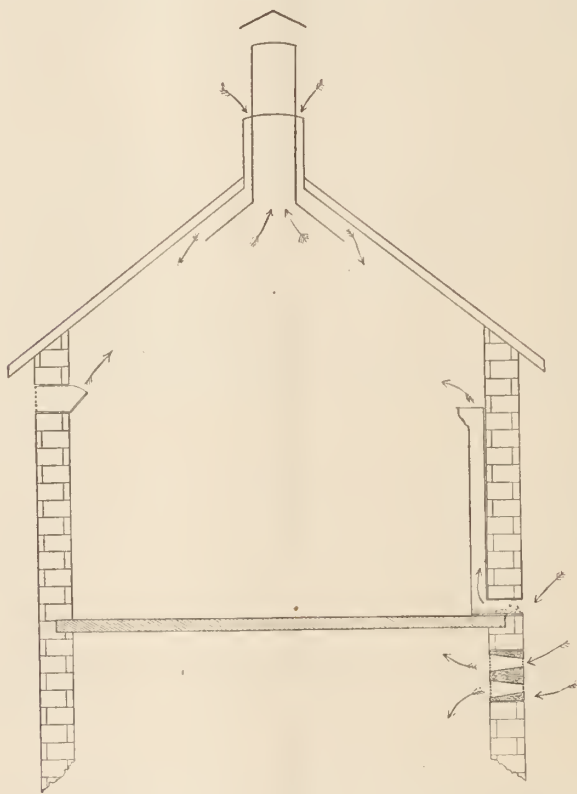


FIG. 5.—Showing several forms of ventilating apparatus.

especially by perflation, is its uncertainty, and the difficulty of governing it. After a certain velocity is reached uncomfortable, and often harmful, draughts are produced, and the inmates of the rooms close the inlets, thus stopping all ventilation, except that which takes place through the walls, and the chinks and crevices in them. However, too great draughts can often be prevented by increasing the friction, by bends, etc., in the ventilating tubes, and by the addition of regulating dampers.

The most important agent in natural ventilation is, however, the movement produced by unequal weights of air. Though the wind might be included under this head, being caused by the same force, the latter acts independently of the wind, especially in closed buildings. As the air expands when heated equal volumes

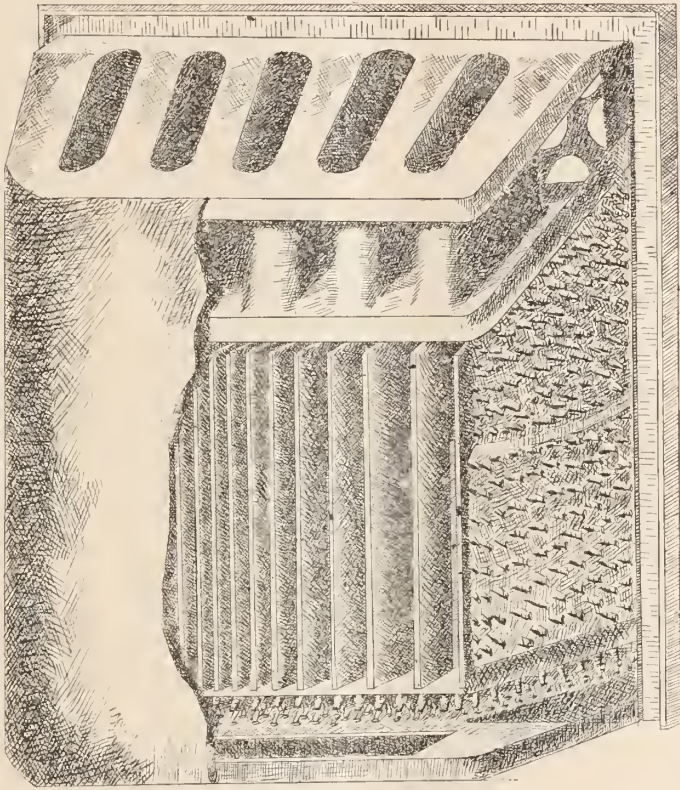


FIG. 6.—Back of patent ventilating grate, showing increased heating surfaces, smoke flues and passages between leading to register.

become lighter than they were hitherto, and colder, heavier air pushes in beneath to occupy the space. But in all inhabited apartments this heating of the air is continually taking place, not only by the lights and fires, but also by the bodies of the occupants ; the movement is, therefore, a continual, though not necessarily an equable one, varying as it does with the temperature of the

out door air, and the number and intensity of the heating agents within. Moreover, there being such a heating and movement of the air, it follows that, unless a room be perfectly air-tight, some of the apertures will act as inlets, and others as outlets, and that the quantity flowing out of the room will be practically equivalent to that flowing into it. Therefore, though this force may not be as powerful or efficient as strong winds at certain times, yet being more constant, more readily calculated, and more controllable, it is the one most to be considered. Not to go into details, it may be stated that from certain well-known laws the pressure, and the velocity of the inflowing or outgoing air may readily be calculated, and that the velocity multiplied by the area of inlets or outlets, with a proper allowance for friction, will give the quantity of air passing through the room, or collection of rooms, in any given time.

There is considerable difference of opinion as to the best locations for inlets and outlets, and as the conditions are necessarily different in every case, and so many factors are to be considered, it is difficult to lay down any general rules. It should be an aim, however, to have the air well distributed throughout the room or rooms, and to have no direct draughts from the inlets either upon the occupants or to the outlets. It is the writer's opinion that, usually, the outlets should be located near the top of the room, owing to the tendency of the used air to rise, and because, in unventilated rooms, the foulest air will be found nearest the ceiling. The location of the inlets will depend on the temperature of the incoming air; if it is cold, it should be admitted near the ceiling, so that it may diffuse and be practically warmed before reaching the occupants of the room; if it is warmed, it may come in near the floor or below the middle level of the room. Consideration must always be given to the loss by friction in the velocity of air passing through incoming or outgoing conduits. This is directly as the length of the tube, and inversely as the diameter of the opening; it is also affected by the shape of the opening, and is especially increased by angles in the tube. Accumulations of dust or dirt also greatly lessen the velocity.

Numerous devices have been suggested for introducing unwarmed out-door air, without discomfort, or for diffusing it through the room. Among these may be mentioned perforated bricks, louvered or double-paned windows, valves, screens, tubes,

etc., illustrations of some of which are given herewith. But in a climate such as our own, and in all cold countries, special measures must be taken during the greater part of the year for warming the out-door air before introducing it into occupied rooms. Practically, we may employ one or both of two kinds of heat for the above purpose, viz., radiant or convected heat.

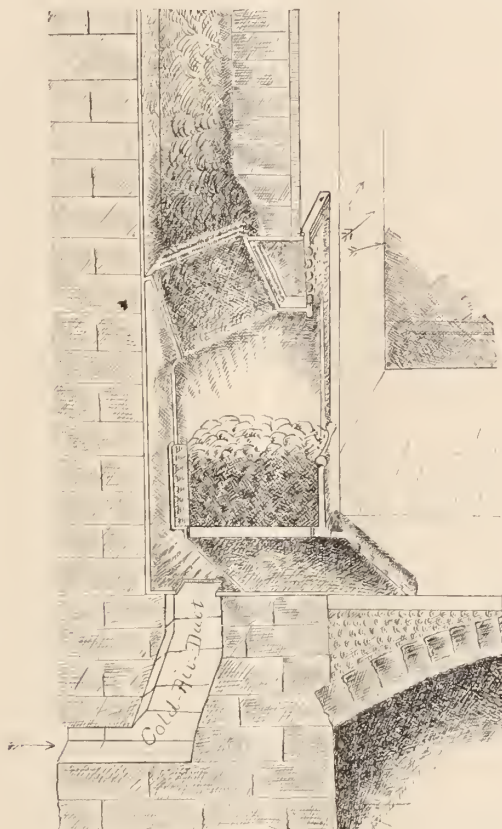


FIG. 6a.—Patent ventilating grate in position.

Conducted heat, that which passes from molecule to molecule of the mass of a substance, is a comparatively slow process, and may conveniently be ignored in this connection. Radiant heat is that which passes directly from its source to the object to be heated without heating the intervening air. It is the most healthful means of heating houses, but it alone utilizes comparatively a small percentage of the efficiency of the fuel and hence

is expensive. Moreover, its intensity lessens as the square of the distance of the object to be heated from the source of heat, and thus is not available for large rooms. We have an example of radiant heat in that coming from open fire-places, and, to a lesser degree, in part of that from closed stoves located in the room.

Convected heat is that which is conveyed from place to place by heated masses of air, steam or water, and, on account of its comparative cheapness and the readiness with which it can be supplied at the places where it is needed, is the kind on which we chiefly have to rely. A combination of radiant and convected heat is, however, often available, in which case we have the pleasurable effects of the one together with the sufficient warmth of the other. As indicated, old-fashioned open fire-places give forth only radiant heat, and utilize only a small part of the fuel efficiency—from 7 per cent. to 12 per cent. If, however, the grates be so arranged, as in the accompanying illustration, so that pure out-door air may be drawn in back of and around them, and thus warmed by heat that would otherwise be wasted, a large amount of convected heat will be added to the radiant, from 25 per cent. to 35 per cent. of the fuel value is utilized, and the ventilation is greatly improved.

All open grates should be so constructed that as much radiant heat as possible may be reflected and thrown out into the room. Figure 7 shows the angle at which the sides should meet the back, while the upper part of the fire-back should be inclined at the same angle to the coals. The burning fuel should also be concentrated, as regards surface, as much as possible.

Stoves utilize a considerable percentage of the fuel, but do not remove much air. Ventilation must be provided by some other means, and is apt to be neglected. Moreover, the stoves, if not properly cared for, may give off dangerous gases and products of combustion. It is often advisable, especially in assembly, school-rooms and the like, to surround the stove with a cylinder extending from the floor toward the ceiling, and to bring in a supply of fresh air from without. This becoming heated, and passing out over the top of the cylinder or drum, furnishes a plentiful supply of convected heat, together with good ventilation. A suitable outlet must, of course, be provided.

Hot-air furnaces supply large quantities of heated air, which may be conveyed by suitable ducts to various parts of the build-

ing. Care must be taken that the furnace does not leak dangerous gases, that the conduits are kept clean, that the air is taken from a clean place out of doors rather than from the cellar, or even the soil around and beneath the house. It is, of course, much more advisable that large quantities of air moderately heated be supplied, rather than small quantities over heated. It is to neglect of some of the above precautions that most of the objections to hot-air furnaces are due. Properly cared for, a hot-air furnace is a powerful ventilating agent, for the large supply of air passing into the house through it must in turn find an exit from the house, and the ventilation be accordingly. It must be stated though that it is often difficult to drive the hot air against the wind, or toward the cold side of the house, and that the warming and ventilation may therefore be uneven, unless other provisions be made.



FIG. 7.—Diagram showing correct angle of sides of open grate with the back.

Steam or hot-water heating, though more expensive in the cost of introduction, is in many respects more satisfactory than any of the other methods. The advantages are that the heat may be supplied at the points where it is wanted, and that extreme uniformity of temperature may be maintained. The coils of pipe may be located in the room (the direct system) or in special chambers to heat air which is afterwards led through conduits to the rooms (the indirect system), or there may be a combination of both of these—the direct-indirect system.

Stoves and grates for burning gas may often be used to advantage for heating small and isolated rooms. The ordinary kinds should all be connected with a flue to carry off the products of combustion of the gas. Recently there has been devised and put in use a gas heater, intended to not only perfectly consume the gas it uses, but to also destroy by fire *all* the impurities of the air in the room in which it is located, thus doing away with

the necessity of ventilation or any supply of air greater than that necessary to furnish simply the oxygen needed by the inmates and by the fire itself. This may seem revolutionary in principle, but experience seems to show that the claim is well founded, and that the apparatus is healthful in its operation. By a carefully regulated Bunsen burner the gas is so perfectly consumed that

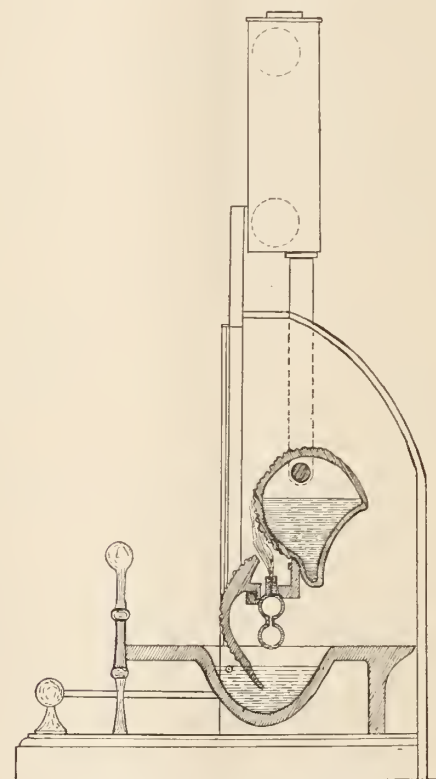


FIG. 8.—Section of gas-burning steam-heating apparatus described in text.

the only product is carbon dioxide, which is harmless in all ordinary quantities. By a peculiar arrangement a continuous current of air is made to pass through the flame, thus burning all impurities, whether gaseous or solid. The heat is also utilized to convert a quantity of water into steam, thus warming the containing coils of pipe, and, in turn, the air surrounding them. The ordinary openings of any room furnish all the ventilation

necessary to allow the exit of the excess of CO_2 and the ingress of fresh air containing sufficient oxygen, as above indicated. It seems certain that after several hours' use there is no sense of impurity in the atmosphere, and that continued employment for months produces no appreciable harmful effect.

It is often necessary, especially in large buildings, to resort to artificial methods of ventilation, the natural ventilation not being sufficient for comfort or health. The artificial force may be used either to draw the air out of the room or building (extraction or aspiration), or to force it in, driving out that which is already within (propulsion, perfilation). We may extract the air by heating that within a shaft into which outlets from all the rooms open, by means of a stream or water jet, or by suitable aspirating fans. The heating of an extraction shaft may be by open fire, steam or hot-water pipes or by gas. The heat should be applied at the bottom of the shaft so as not to waste it and to heat the whole column of air in the shaft. The objections to this method of ventilation are: (*a*) Inequality of draught, due to varying temperature, quantity of fuel, etc.; (*b*) unequal movement from different rooms, unless the outlet pipes are very carefully calculated and arranged; (*c*) possibility of smoke or air escaping from shaft to rooms if current is checked at any time; (*d*) impossibility of controlling the inlets and of accurately regulating the supply. Where an extracting fan is used the flow may be more evenly regulated, as the velocity and volume of air will depend on the speed of revolution of the fan. For instance, a certain fan, thirteen and a half feet in diameter, at sixty revolutions per minute, extracts 45,000 cubic feet of air per minute, the velocity being 782 feet per minute. A cone of steam sets in motion a volume of air of more than 200 times its own bulk.

While the steam or water jet might be used for perfilation as well as for aspiration, the fan or blower is practically about the only method employed in ventilation by propulsion, and, doubtless, as electricity supplants steam in cheapness and convenience, there will be a more common use of this method than there has been hitherto. For ventilation by propulsion has the advantage that it is more certain, that the amount of air thrown into the building can be varied at will and that it can be taken from any point desired, while the use of electricity will lessen the main disadvantages, which were cost of running and danger of prolonged stoppage.

Ice—How to Obtain It Pure.¹

BY WILLIAM R. D. BLACKWOOD, M.D.,
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ANY curious delusions are held by people concerning food, and in no branch of dietetics do we hear more foolish remarks made than those referring to water and its purity. A good many well-informed persons believe that if water is only clear it is therefore good in all respects; the contrary is frequently the case. So, also, with ice—a material used so commonly as to be now absolutely a necessity, particularly in cities. Most folks think that ice “purifies” itself in freezing by some mysterious process, but how it does this they can’t say; sometimes they tell you that it squeezes all the impurities out during congelation; but this is not so. The truth is, that instead of doing this, during the freezing process ice imprisons many mechanical and other impure substances, and many of these foreign bodies may be very prejudicial to the health of those who consume the article in any way which carries the ice into the stomach. It is well known that many germs which are inimical to health are not killed by even long-continued cold, even if the temperature is carried far below zero. Among these it is said on good authority that the bacillus of typhoid fever is highly resistant to freezing, and, if this is so, the matter of a pure source for ice destined for drinking purposes is extremely important to denizens of cities who depend on supplies sought and obtained any or everywhere at the cheapest or the most convenient rate, usually from the nearest water-course. One of the greatest fallacies connected with the matter of potable water is the supposition that the stream purifies itself in its passage over rocks and shallow places; that “oxygenation” goes on, as the chemists have it. Such cannot be the case at all, for water cannot be oxidized without transforming it into something else than water. The fluid is H_2O , and any additional oxygen, be it one or more atoms, cannot be taken up and the fluid still remain

¹ From The Medical Bulletin.

water. To get over this difficulty, when it is advanced by those who know it, chemists and others interested in the subject then pretend that the impurities contained in water flowing in rivers, and used for drinking purposes after it is more or less saturated with the sewage of towns above the pumping stations, are oxidized; this is not so any more than in the case of the water itself. Human urine or fæcal matter, or the excrement of animals living in or outside the stream, is precisely the same, no matter how much oxygen you add to it, and oxidized urine or fæces is not fit to drink even by the most enthusiastic chemist. Another fallacy about water is the idea that filtering it through mixtures of gravel and charcoal, or similar materials, will remove all germs from it; this is not so either, as nothing but the coarser mechanical impurities are kept back by the filters. The twigs, straws, particles of decayed fish, and other foreign matters are strained out, of course, but such material as is capable of solution in the water goes right through unchanged (including 'albuminoids'), no matter what the apparatus may be made of. When we remember that many of the most poisonous discharges from other diseases than typhoid—for example, dysentery—are apt to be thrown into the nearest water course, this fact becomes a very important one in a hygienic aspect, if the position we take in reference to filtering be true (which we are not at all alarmed about in the way of successful contradiction). So, what are you going to do about it? The only answer is: We are going to be very careful to adopt all known precautions in the way of obtaining a pure supply of water for drinking and cooking. Are you? Well, where are you going to get it? Not to speak of Philadelphia, which is furnished with water obtained from the sewer known as the Schuylkill, where is there a city in this region which does not get its water supply from a source contaminated with the sewage of the towns above it? Don't you know that every stream from which any town gets its water by pumping is fouled by the drainage of other villages or towns higher up? Is it not a fact that all communities discharge their surface drainage by gravity into the water courses in the valleys near by? Even though a city or town be set upon a hill where it cannot be hid, its sewage goes without restraint down grade to the creek or river, wherein it is hid, and whence it is drawn by hydraulic machinery for the solace and comfort on warm days of the innocent inhabitants of such places as cannot obtain enough water from the ancient system of

wells for their daily uses—to their discomfort, although they may not know it, and often to their safety in the line of health. This being so (and it is), we must do something to keep out of danger through water poisoning, which is just as dangerous as food poisoning by ptomaines; and the usual advice by those interested in such matters is to boil all the water used for cooking and drinking—a plan which is very good indeed, but very hard to follow by the busy housewife, who gets no time to do anything which is not really needed, in her view of matters. She may do this for a while, but by-and-by the trouble is too great, and the care needed in keeping fires going continually simply to furnish water to the family is expensive and excessive; so she quits, and the folks have to put up with the aqueous food just as it comes from the spigots, dirt and all, with the multiform microbes thrown in. This should not be, in a civilized community; yet, how can we overcome the difficulty? It may be done as the writer does in his family, and here is the plan: We boil all the water required for cooking, and use melted ice for all drinking purposes invariably. All water used for culinary work is filtered through a "Globe" filter, which is quite cheap. This little apparatus is not only an inexpensive affair, but it is efficient, as it can be reversed daily to wash out the debris retained behind the flow; and one would be surprised at first to see what a lot of dirt is kept out of the water by this excellent adjunct to the kitchen supply. The affair is about the size of a small cocoanut, and is attached to the kitchen cold-water spigot by a collar and binding screws. So much for one point; now for the other—the method of having actually pure ice or water for quenching thirst, or for mixing with such other beverages as you may suppose are better than plain aqua for this end.

Seeing that ice from contaminated sources, such as rivers and lakes into which drainage enters from towns and hilly regions populated more or less densely, must necessarily be impure, how are we going to solve the problem of a clean supply of ice? The answer must be, that we shall go where ice can be cut on waters into which no drainage enters. But where is this now possible? It is impossible! Every lake or pond, every river or creek, every brook or rivulet this side of the Mississippi is an open drain for the surrounding country, and, though some streams may be purer than others, none are exempt from suspicion; hence we must go farther for our answer. Where, then, shall we go?

Fortunately, art is getting the better of nature steadily, and in nothing concerning the benefit of man is art further ahead (electricity alone excepted) than in this very direction. We have long heated our domiciles in cold weather by artificial means, and the day is not far distant when we shall cool them in summer with equal facility by refrigerant diffusion of force, exactly as we now light our homes and other buildings by a correlated form of force—electricity. It is just as easy to manufacture cold as it is to generate heat; brewers don't depend on storage of ice now as they did not long ago, and the principle they employ is rapidly growing for another purpose—that of the artificial manufacture of ice. Not only is ice thus made economically, but it is made in a state of purity which nature cannot approach with all its advantages. The principle involved in the production of extreme cold by proper machinery is based on the fact that, when a suitable fluid or gas is compressed to such an extent that it becomes either a liquid or a solid, and this product is afterward permitted to expand more or less suddenly, it absorbs heat from the nearest objects which can supply it, the consequence being cooling of the subject thus affected; and as the temperature reduction thus set up may be placed at any desired point, we can either simply cool or freeze that object. Now, when nature freezes water, it does so at temperatures hovering somewhere about thirty-two degrees, and not very much below that point, except in high latitudes; so the ice thus formed is not by any means so dense in texture as that which would be gotten were the temperature involved away down below zero. Practically speaking, our ice in commerce is cut in localities where the cold does not go to zero except on a few days in the winter; so we are not sure that the ice thus made is as hard as we should like it to be, and it is thus not at all an economical product, for ice not exposed to very low temperatures before marketing is much more easily melted than that gathered when the air is cold enough to "freeze the tail off a brass monkey." Of course, there is ice to be had from lakes 'way up in Maine, but all can't get this, for it comes high. Now to the point of our paper: Under proper methods we can freeze water right in our large cities at any desired temperature ranging from thirty-two degrees to any lower degree we choose, and this ice is not alone economical in being dense, but it is absolutely pure in every way—it is free from any and all germs—it is the analogue, when melted, of the few known springs in nature from which

actually clean and pure water flows. This is known as "artificial ice,"—a misnomer, indeed; for ice is ice, however made.

Now, let us take up another point in this matter of purity of ice and water, which is the absurd idea held by persons who don't know the *rationale* of the production, and who imagine that the ice thus made contains "chemicals," as they term it. When your tyrant puts the dinner on the range to cook, she exposes the food in the pots and pans to the heat set free by combustion of the coal, and this heat is absorbed by the utensils and through them by the beef, potatoes, puddings, and what not. The red-hot coals don't get into the edibles, do they? Certainly not! The combustible part of the fuel liberates caloric, and this does the work of cooking, while the incombustible residue goes through the grate-bars as ashes, and is thrown into the ash-barrel by the careful housewife, and by the sloven over the fence into the neighbor's yard or the street. So in the case of refrigeration by machinery. The sudden expansion of compressed liquids or gases absorbs heat from the adjoining substances, and they thus liberating caloric must change their form, just as the coal does in the fire. The water thus treated, when it loses its latent heat (heat insensibly locked up in the fluid), becomes ice. The compressed material does not touch the ice at all, or the water which is frozen, any more than the fire does the canvas back in the oven. The refrigerant circulates around the outside of the pans containing the water just as the heat circulates around the exterior of the oven. The two processes are identical, but reversed in their utilization: in cooking, we absorb heat from the fuel; in freezing, we give away heat to the expanding refrigerant agent.

Ice made by machinery has many advantages over that cut from rivers or ponds: (1) it is absolutely pure; (2) it is much more economical at the same price than the so-called "natural ice," for, being harder, it lasts longer; (3) we don't depend on a good hard winter for our crop, for it is made actually better in the heat of summer than in winter; (4) it is uniform in its character day by day—it is not clear one day and snowy the next; and, lastly, it can be had at about the same price year by year, for the plant does not depend on Providence for cold, but it is made to order by the manager. They talk of a lady who was greatly incensed when she learned that her chunk was from a lot that had been kept over from the second winter before the dog-days during

which she purchased it. If you feel that way yourself, you may be gratified to know that manufactured ice is always fresh ; it is made all the time, and, by getting on the right side of the company, you can have your particular piece frozen just before the wagon starts out on its morning or evening delivery. This is surely worth something, anyhow, isn't it ?

It may be asked how we know that this particular kind of ice is absolutely pure, and this is the answer: All the water used in its facture is distilled before using it; it therefore must be perfectly free from germs of all kinds, and, as heat carried to the boiling-point is the only sterilizer worthy of reliance all the time and under all possible conditions, the water thus treated cannot be other than sterile, for it is not only boiled, but vaporized and condensed, after being transformed into super-heated steam. In all its travels the water is carried through and by pipes and other containers which are literally clean, and into which nothing but the water to be frozen is ever permitted to enter; hence nothing foreign can by any possibility gain admittance into the ice, or touch it till it is taken out of the cans for disposal to consumers. As ice does not absorb air or other matters touching its exterior aspect without melting, it follows that the blocks must be pure, and a simple washing before setting it aside in the refrigerator or family ice-chest will free it from any dust which may have gotten on it during its excursion from the factory to the purchaser.

Such, in brief, is the method of producing pure ice at will; many factories now exist for its manufacture, some of which are owned by companies who run down the method by sneers and misrepresentations, but who all the same keep their stock full on the sly in their houses, and who now draw ice from our northern lakes and rivers by a hundred tons, where they used to cut 10,000. In most instances, however, the sale of ice thus made is open, for those who require large quantities in transacting their business, have learned that the machine-made ice is as preferable to the ordinary kind as electricity is when compared with a tallow-candle.

Time and space will not admit at present of a detailed account of the mechanism involved, but I may in a future paper give this, which is extremely interesting indeed. I am indebted to the officers of the "Fairmount Ice Manufacturing Company" of Philadelphia, for much courtesy in examining their plant,

the most extensive in this country ; certainly the best in all respects, for the whole establishment is built on the ideal method which holds the best of everything to be the cheapest in the end.

All the water used in the entire plant is drawn from two artesian wells, the supply being as pure as that known anywhere; it is free from nitrates, chlorides, albuminoid matter, sand, and all other known dirt ; this passing three times through the steam boilers, and between each time through enormous filters, must of necessity be perfectly sterile before freezing. No hand touches the fluid or the refrigerant (anhydrous ammonia) at any time. Everything is automatic in operation; the first time anything is touched at all is when the ice is placed in the delivery wagons. Under such surroundings the product must be pure, and, therefore, our query as to how we can get what we need in this line is answered—get manufactured ice wherever possible. Although no other plant, either in this country or abroad, is anywhere near this one for completeness, others are based somewhat on similar principles ; so it is not so hard to get the article pure as might be thought, for factories are springing up broadcast as the advantages of the product become known. In closing, the writer advises those who can get ice made by machinery to do so in the interest of health, happiness, and hygienic cleanliness; and if you can make it convenient, sometime look through this wonderful establishment, where the managers are always glad to see visitors, and the work goes on ceaselessly day and night the whole year round.

The Value of the Three "Ifs."

At a meeting of the Funeral Reform Association of England, a letter was read from Lord Playfair, of which the following is an extract : "If the coffin be of a perishable nature, if the soil be dry and porous, if the grave be not too crowded, the dead are resolved into air and into ashes as certainly in three years as they are in a furnace in the course of an hour, and in both cases without injury to the living." *The British Medical Journal* aptly says that a graveyard thus used would be a garden where the dead are resolved naturally, successfully and inexpensively.

The Use of Milk in Health.¹

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THE object of this brief paper is to present a few important data upon which to base the rational administration of cow's milk in health. Milk is a substance furnished and intended by nature as the sole food for the young of all mammals, and, for a considerable period of their existence, they feed upon it exclusively. It, there-

fore, represents a complete food, in which are present all the elements necessary for the nutrition and growth of the body. The various substances composing milk and their relative proportions vary within comparatively wide limits, not only in different races and breeds, but the milk of the individual is subject to extensive variation. Some of the causes are: Age, period of lactation, nature and amount of food, time of feeding, state of health and the treatment of the animal. Scrupulous care and kindness should ever attend the milk-producing cow.

It is stated on good authority that a cow, if frightened, will lose a large percentage of her butter fats for twenty-four hours. As showing the influence of the nervous system on the formation of milk, and controlling the relative proportions, also the total amount: Two years ago I attended a child in convulsions caused by the ingestion of unhealthy milk. On investigation, I ascertained that the milk had been secured from a cow that during the night had broken her chain and gained access to a barrel of swill from which she gorged herself. A few days since I saw a child suffering from indigestion, fever and vomiting produced by the taking of its mother's milk which, later in the day, it refused. In this case the milk was altered through the influence of emotional excitement brought on by an altercation with her husband on the subject of intemperance.

It is evident that many conditions will influence the character of milk, varying in degree from a slight loss in the percentage of

¹ From the Medical and Surgical Reporter.

some of its constituents to a profound chemical change, so that it becomes poisonous.

In consulting the different authors, I find a marked discrepancy in the analysis of milk, showing conclusively that it is not uniform in its composition. According to Foster,¹ milk contains :

	WOMAN.	COW.
Water	90.	87.
Fats	2.75	4.
Sugar	5.	4.4
Proteids	2.	4
Salts	.25	.60
	100.00	100.00

The fact that human milk is poorer in proteids, fats and salts, is of practical importance when cow's milk is substituted in the feeding of infants. The chemical reaction of human milk is alkaline ; cow's milk neutral or acid. Human milk is free from bacteria ; cow's milk contains numerous bacteria, when it reaches the consumer. Human milk is richer in sugar and water than cow's milk.

In the process of digestion, the casein of human milk coagulates in small flocculi in the stomach and is readily digested, while that of cow's milk forms large and firm coagula which dissolves with difficulty in the gastric juice. In prescribing milk, it behooves to keep constantly before the mind the above facts to assure success in the use of this important agent. I am of the opinion, that, with close study of each case on the part of the physician, and a reasonable amount of intelligence on the part of mother or nurse, the cow's milk can be so modified as to bear so close a resemblance to human milk, that it becomes applicable in a large majority of cases.

Moreover, it has been conceded by all the higher authorities that animal milk is the proper food for children during the period of growth and development.

Prof. Henoch,² of Germany, says : "Cow's milk is but the substitute for mother's milk during the entire period of infancy. I consider the administration of other substances advisable only when good cow's milk cannot be obtained."

¹ Text Book on Physiology.

² Lecture on Diseases of Children.

J. Lewis Smith,¹ of New York, says: "Milk should be the chief article of food during infancy. After the first year the food may be made of such consistence as to be given with a spoon."

A. Jacobi,² of New York, says: "The substitute should be as near normal woman's milk as possible; and, naturally, when the latter cannot be had, animal milks are selected."

For the adult body in a state of health, milk is not a typical food. To furnish the required amount of carbo-hydrates, to supply potential energy for moderate labor, twenty pints would be required, which would give an excess of fats and proteids; so large a quantity of fluid would interfere with the digestive function, and soon overtax the kidneys.

The food for adults, therefore, must be more concentrated, and richer in the carbo-hydrates.

The most important use of milk in health is in the feeding of infants and children. During this period, when the circulation and metabolism is most active, the tissues containing an excess of water, milk is peculiarly adapted for the nutrition of the body.

To be successful in the use of milk, the following conditions must be observed:

1. The quality of milk used.
2. " quantity of milk used.
3. " time of feeding.
4. " manner of feeding.
5. " proper dilution.
6. " " addition.
7. " predigestion.

Milk should be as fresh as possible, and preserved upon ice. If this is impracticable, it should be sterilized and bottled and kept cool. If milk, free from impurities and perfectly fresh, can be procured twice daily, it is not always essential that it should be sterilized. Milk should have a sweetish taste; neutral or but faintly acid in reaction. Specific gravity 1029. Should contain not less than 3 per cent., nor more than $4\frac{1}{2}$ per cent. of fats. The proteids, consisting of albumin and casein, should constitute about 4 per cent. The salts, consisting of phosphate of calcium, potassium and magnesium, potassium chloride with traces of iron and other substances, must also exist in a fair percentage. The fats and proteids are more subject to variations than other

¹ Diseases of Children.

² Intestinal Diseases of Children.

constituents of milk; therefore, demanding the most careful attention.

In regard to the quantity of milk given at each feeding, much care should be exercised. I am convinced that more children are overfed than underfed. We should ever remember the capacity of the little stomach designed to receive and digest the milk.

According to the measurements of Dr. T. M. Rotch,¹ of Boston: "The capacity of an infant's stomach 5 days old, is twenty-five cubic centimetres (seven and a half drachms); 2 months, 120 cubic centimetres (four ounces); 12 months, 300 cubic centimetres (ten ounces); 2 years, 740 cubic centimetres (twenty-five ounces). In regulating the amount of milk, a fixed rule cannot be adhered to in all cases, since individuals differ in their capacity and physiological demands. I am guided somewhat by the following index :

AGE.	INTERVALS.	AMOUNT.
1 Month	Every 2 hours during the	1 ounce.
2 Months		2 ounces.
3 "	Every 2½ hours during the day.	3 "
4 "		4 "
5 "		5 "
6 "		6 "
7 "	Every 3 hours during the day	6 "
8 "		6 "
9 "		6 "
10 "		6 "
11 "		6 "
12 "		6 "

I feed as little as possible between the hours of 9 P.M. and 5 A.M., thus giving the child and attendant ample time for sleep. Some children can do with one feeding, others demand food two or three times during the night. As the child advances in age, I decrease the night feedings, and prolong the hours of sleep.

The manner of feeding resolves itself into the simplest possible mode. Infants under 12 months of age should feed exclusively from the bottle. In selecting the fittings, avoid all ostentation. I prefer a plain bottle with a short neck, with a capacity adapted to the age of the child, and a plain rubber nipple with a small aperture. The child while nursing should repose in a comfortable position, and be attended by a person who

¹Cyclopædia of Diseases of Children, Keating.

will remove the bottle as soon as the supply of milk is exhausted. Under no conditions should the child be permitted to suck or play with the empty bottle. It should immediately be cleaned and placed in water, or water with the addition of soda or borax, until the next feeding. Milk should always be given at a uniform temperature, approaching that of the normal temperature of the stomach, about 100° F.

In substituting cow's milk for human milk, it is important to modify the former, so as to more closely resemble the latter. In comparing the analyses of the two, we observe that the cow's milk is richer in proteids, fats and salts. Very naturally, we endeavor to reduce these elements to their proper percentage; this is accomplished by the addition of water, which reduces all the constituents in an equal proportion, even those that are already deficient; this necessitates the addition of such constituents. The water employed for dilution should always be boiled to destroy all organic substances which it may contain.

Water not only acts as a diluent, but alters the physical condition of the casein so as to render it more digestible by preventing the formation of large coagula during peptogenic digestion.

The degree of dilution necessarily depends upon the composition of the milk, the age and condition of the child. The following is my rule for dilution :

Age	1 Month,	1	Part of Milk to 3	Parts of Water.
"	2 Months,	1	"	" 2 " "
"	3	" 2	"	" 2 " "
"	6	" 3	"	" 2 " "
"	9	" 3	"	" 1 " "
"	12	" 6	"	" 1 " "

In case of indigestion, which is frequently due to an inordinate amount of proteids or fats, my experience has taught me that by increased dilution, and a reduction in the quantity of each feeding, the child is soon restored to its normal condition. There are also cases in which the fats are poorly digested and cause fatty diarrhœa; under such conditions a portion of the fats should be removed and the usual quantity of water added.

Milk that has been properly diluted requires the addition of such elements as are deficient. Sugar should be added to the amount of two drachms to the pint. The kind of sugar which should be used is unimportant. It is natural to suppose that milk-sugar should be preferred, since it is a normal constituent of

milk. Cane-sugar, however, is less liable to undergo fermentation and is more readily digested. If a good quality of milk is used, it is seldom necessary to add cream; yet, in cases of constipation, I have found the addition of cream to be beneficial. Owing to cow's milk being more or less acid, the addition of an alkali is essential; bicarbonate of soda or lime water will meet this indication. If constipation exists, phosphate of soda or magnesia should be used. Authors frequently speak of additions of farinaceous substances. My experience with these agents has been unsatisfactory. They are useful only so far as their mechanical action on the milk and irritating influence on the bowels are desirable. They are objectionable for two reasons: (1) They differ too materially from normal milk elements; (2) they are difficult to digest. During early childhood the peptogenic functions predominate; the diastatic functions are not fully developed until later in life; and not until these two functions are equally balanced do we find vegetable matter properly digested. These substances undergo a more radical chemical change during digestion than animal substances. Since the peristalsis in children is more active, and the bowel comparatively short—according to Treves: "The length of the small intestine at birth is nine feet, and the colon one foot"—the food does not remain sufficient time in the bowels for perfect solution and absorption of vegetable substances.

In children of naturally feeble digestion it is necessary not only to modify the milk by dilution and additions, but to pre-digest it to a degree that the most delicate stomach will retain and digest it. This is accomplished by the use of a digestion ferment, either pepsin or extract pancreatis. So far as my experience goes, I prefer the pancreatis, its peptonizing action is more energetic and capable of digesting every form of food. The casein is so altered as to resemble human milk, and is regarded by Dr. Albert R. Leeds as humanized milk.

In conclusion, as soon as we recognize the importance of this subject, and exercise the same care in the selection and administration of milk that we exercise in the selection and administration of drugs, and more fully appreciate the appeal that is made to us year after year by that gigantic infant mortality, so soon will we reach a consummation most desirable.

The Prevention of Contagious and Infectious Diseases.¹



O other field of work for health authorities offers such immediate and palpable returns as efforts for the prevention of infectious and contagious diseases; and while sanitarians are properly interested in all matters that affect the public health, the work nearest at hand is to prevent the spread of communicable diseases. The idea that contagious diseases can arise *de novo* has been abandoned. No conceivable conditions of filth or bad sanitary surroundings can give rise to small-pox, scarlet fever or measles, and the same is probably true of diphtheria, typhoid fever and other infectious or contagious diseases.

Filthy people inhabiting filthy quarters are undoubtedly more apt to be affected when exposed to many of this class of diseases, and more easily succumb; but while in nowise underrating the necessity for sewerage, the removal of garbage or other measures to beget cleanliness, and with a full recognition of the fact that the improved sanitary habits of modern civilization have greatly reduced the prevalence of many of the zymotic diseases, it yet remains that sanitation is no safeguard against contagion.

The public has been well educated in the prevention of small-pox, and health officials are supported in the severest measures to prevent its spread. When a case of small-pox occurs in a community, the public demands the removal of the patient outside of the village or city limits. It is true this is not usually done except with the poorer classes where the patient cannot be properly isolated at his home, but it is quite probable, if proper quarters were provided where patients could receive the attention and comforts of home, that health authorities would be supported in the removal of all small-pox patients, provided it could be done without jeopardizing their chances of recovery.

Small-pox patients are given a wide berth by most people, and dread of the disease enforces quarantine; but to insure that no one will go into or come from a house containing small-pox, the public demands that guards be stationed there night and day. If a person should in any way be exposed to small-pox, he and

¹ From the Monthly Sanitary Record.

his family, if he cannot be separated from them, are quarantined for fourteen days or more, and to enforce this order, guards, if deemed necessary, are stationed over the house.

Physicians who are treating small-pox patients will not be employed by many families from the fear that he may communicate the disease, although he is expected and even required to use the greatest precautions to prevent doing so. Physicians who take no precautions in diphtheria and scarlet fever will, without coercion, change their clothing and thoroughly disinfect their person after visiting a small-pox patient. Quite likely the physician, if asked, would admit that he has far less dread of small-pox than of diphtheria.

When death occurs in small-pox the burial is after night, and not even the members of the family are permitted to attend. Disinfection is most complete, and the bedding and clothing of the patient are burned; it not infrequently happens that the house itself occupied by the patient and all its contents are destroyed.

The cost of all these measures of prevention, which are usually considerable, are cheerfully borne by the public. Sixty-eight cases of small-pox in Akron, Ohio, cost in actual outlay over \$10,000. Indirectly, by loss of business and by keeping people away from the city, small-pox cost Akron many times this amount.

Vaccination has made small-pox a comparatively mild disease, and is credited with causing it to be one of our most infrequent plagues. Without questioning the power of vaccination to prevent small-pox, is it not more than probable that the rareness of this disease is due in a large measure to the fact that such thorough means are taken to prevent its spread? Are we not, in claiming so much for vaccination, in danger of losing sight of isolation, quarantine and disinfection as the best measures with which to control not only small-pox but all contagious and infectious diseases?

The means taken to prevent small-pox, and which are required of health authorities by the people, are the means modern sanitary science demands for the control of all communicable diseases. These are:

(1) *The Removal of the Patient.*—This necessitates a hospital for infectious diseases. The experience of England and many European cities has shown that such diseases cannot be successfully confined to the homes of the patients, and every city

should provide itself with a place where cases of small-pox, diphtheria, scarlet fever, and possibly measles could be taken. Nurses and medical attendance when required should be provided for such patients.

A housebreaker is "isolated" in the penitentiary; why? For the protection of property. This is done at the public expense, the prisoner being furnished with food, lodging and clothing. Is it not as essential that human life should be protected by the proper isolation of a person affected with a dangerous contagious disease? While a person with small-pox is not a criminal, he is more dangerous to society when at large than a thief or housebreaker.

(2) *Quarantine of Exposed Persons.*—This can usually be done in the house from which the person was removed, but not always. If a man is removed from a house who has small-pox it is necessary to disinfect the house and contents as soon after his removal as possible. In many instances the house (the family may have but one or two rooms) cannot be disinfected without removing the inmates. Where shall they be taken? You cannot place them in any other occupied house. The same is true of diphtheria and scarlet fever, and so a hospital of detention is required. After the patient has been removed the family and exposed persons should be taken to the detention hospital where they can receive a bath while their worn clothing is being disinfected. In the meantime the health officials should have taken charge of the house and thoroughly disinfected it. All movable articles should be taken in a van kept for the purpose to a central disinfecting station, where they should be steam disinfected, and returned to the house after it has been properly disinfected. The family, who have been waiting in the detention hospital, can now be returned to their home, where they can be quarantined during the incubation period of the disease to which they have been exposed. In some instances this might be simply a quarantine of observation. That is, the exposed persons might be permitted to go at large provided they were examined once or twice daily by a physician, who would detect symptoms of disease before there would be danger to the public.

Instead of a central disinfecting station, portable disinfecting apparatus, which can be taken to the house to be disinfected, may be used.

These are not ideal provisions for preventing spread of con-

tagion. They are now to be found in many European cities, and some of our own cities have also adopted similar means and appliances for dealing with contagious diseases.

Why should diphtheria, scarlet fever and measles be permitted to prevail month after month and year after year? It cannot be questioned that they can in large measure be prevented by the enforcement of the measures above recommended. Many instances are at hand in our own State to show that even strict isolation and quarantine at the home with disinfection will put an immediate stop to the spread of contagion. Where diphtheria has been imported to a village previously free from the disease, it has frequently been limited to the initial case by the prompt action of the health authorities. On the other hand, where the disease has been allowed to spread owing to the tardy action of health officials, it not infrequently happens that it continues to prevail to a greater or less extent for years afterward.

Our large cities are never free from diphtheria. This used to be explained on the ground that diphtheria is a filth disease due to the bad sanitary conditions always present in some quarters of large cities; but filth does not generate diphtheria, and the continued presence of the disease is due, we believe, to other causes which might be controlled. The measures that *should* be taken to prevent contagious diseases from spreading have been pointed out—virtually the measures that are demanded by the public in the prevention of small-pox. Let us briefly consider those that *are* taken by our health boards in cities, with but few exceptions. Cases of diphtheria and scarlet fever are usually quite promptly reported to the health board by the attending physicians as required. A card warning the public of the nature of the disease is placed on the house of the patient. The family is possibly given one of the State Board of Health's pamphlets containing instructions for disinfection, etc. The superintendent of schools is usually notified to exclude children from school who come from the patient's house. After a time the board will receive notice from the attending physician, or possibly from the family, that the patient has recovered. The family will be told to disinfect the house, the placard will be removed and the children are permitted to return to school.

These measures are well enough as far as they go, and have undoubtedly limited the presence of contagious diseases. We may, indeed, be thankful that the conditions are not as they were prior

to the establishment of a State Board of Health, when but a small percentage of our towns were provided with boards of health, and no systematic or official action was taken to prevent contagious diseases. But there are many weak spots in the barriers boards of health have attempted to throw around communicable diseases. There is seldom any restraint placed on the going or coming of parents of children suffering with diphtheria or scarlet fever, yet there is not the least doubt but that either disease may be carried in their clothing if, as is usually the case, they are nursing the patient. It is true the child is often isolated at home, and if it is not seriously ill the father may not enter the sick room, but when death occurs or is threatened the father will undoubtedly be with his child. Unless restrained he will mingle with the public—possibly sit next to some child in a street car or railway car, and so the disease is spread. While it may often work great hardship in individual cases, public safety demands, in diphtheria and scarlet fever, as well as in small-pox, if the patient must be treated at home, *that the whole family must be quarantined until danger of communicating the disease is over.*

It is a pleasure to note that two or three of our cities and several villages have adopted and enforce this rule. When the case is reported the bread-winner of the family is given a choice between remaining at home in quarantine or he may change clothing and continue his occupation without returning home under penalty of being kept there.

After death or recovery of the patient disinfection must be practiced. Probably the lack of proper disinfection as much as anything else explains the continued prevalence of contagious diseases. Not one man in a hundred can be depended on to properly disinfect a house and its contents. He seldom realizes the necessity for strict attention to the minutiae of the work, and many articles escape disinfection.

The following case illustrates how diphtheria may be spread: A gentleman living in Ohio lost a young child from diphtheria. The child's clothing and playthings were boxed up and placed in the garret. Some time after this the man and wife moved to Kansas, where another child was born to them. More than two years afterward the box containing the things belonging to his dead child was opened, and the playthings given to his second child and to other children in another family with whom he was living. Within ten days two of these children were dead with

diphtheria. Disinfection of the child's playthings would have prevented these two deaths.

Disinfection, then, should always be done by an officer of the board of health *who is familiar with the work, or at least under his direct supervision.*

When we think of the thousands of lives sacrificed in our State each year to contagion, and realize that this could be largely prevented if we would only do what we know should and could be done, it is apparent that a great work remains for our boards of health to do in the prevention of contagious and infectious diseases.

Museum of Hygiene, Medical Department, U. S. Navy.

This institution, which has its home at 1707 New York Avenue, Washington, D. C., was founded and officially recognized by Congress in 1883. Since then it has grown under the fostering care of Surgeon General John M. Browne, Medical Director Philip S. Wales, and Surgeons White, Kidder, Owens, Ames and others. Its catalogue, recently issued to indicate the extent and direction of its growth, is an octavo pamphlet of 136 pages, which contains a list of about 2000 specimens illustrating conditions of local hygiene pertaining to soil, air, the construction of dwellings and their aggregation into towns and cities; and of course the construction of ships with their heating, lighting, ventilation, air space and other accommodations or lack of accommodations does not fail to take a prominent place in the collection. Food supplies, clothing, safety-appliances in traveling by land or water, protection against fire, etc., disinfection and the care of wounded men also find satisfactory provision for their illustration. The catalogue gives carefully prepared descriptions of so many of the specimens that a perusal of its pages would to many minds be almost equivalent to a personal inspection of the institution. If the existence of the Museum were more generally known there is no doubt that it would become the depository of many specimens at present isolated in the cabinets of medical men and therefore almost valueless for educational purposes. We commend the Museum of Hygiene and give increased publicity to the desire of its director, Medical Director Wales, to extend the sphere of its usefulness.

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Mature Reflections Upon Hygiene.

HUMANITY may be divided into three classes, so far as its relationship to hygiene is concerned. Class first is made up of those who are always fearful lest they may possibly infringe some law of health ; generally, such persons are recent converts to the science of hygiene, and, like all converts to everything else, they are filled with zeal, trying thereby to make up for lost time. The members of this class are nuisances to themselves and to everybody about them ; but a passage through this stage is almost necessary that we may evolve into the third class, in which class, in the course of time, we hope to see enrolled every human being.

In class second we find those fatalists who scoff at hygiene, who ridicule the idea that we have any control over health, and who live utterly regardless of the fact that their very lives originate and are maintained in accordance with definite laws. Such persons seem to think that they are here by chance, and such persons can be classed only as fools, save in those exceptional instances wherein ignorance can be pleaded in extenuation of their folly.

Now, in the third class, we find those who, having familiarized themselves with the fundamental, dogmatic doctrines of hygiene, live quietly in accordance therewith ; so quietly and so unostentatiously that no one is led to comment upon their methods of life. The best-dressed man is he who so dresses that no one knows when he buys new clothes ; so the best disciple of Hygeia

is he whose undemonstrative devotion to the goddess fails to evoke the comment of his neighbors. Quiet enthusiasm is a commendable trait, but noisy, demonstrative enthusiasm, the devotion that leads to introspection, is to be condemned.

Think not always of yourself and your health; learn the fundamental laws that regulate healthy human existence and observe them quietly; leave the delicate and vexed questions of hygiene to the expert sanitarian, just as you relegate the intricacies of law to the lawyer. It is enough for the layman to have a general knowledge of the fundamental doctrines of law, knowledge enough to make him a *good* citizen; so is it also sufficient for him to have a general knowledge of the fundamental doctrines of hygiene, enough to make him a *healthy* citizen. With the intricacies of law and with the intricacies of hygiene the average citizen had better have nothing to do; let him blindly accept the legal opinions of his lawyer and the hygienic opinions of his doctor and we will be making a great stride toward the millenium.

The Results of Coddling.

We know what is the matter with him, and have known it all along. He is very delicate, and the least draught of air will throw him into a chill. He suffers from cold feet and darting pains, and has the most miserable kind of an appetite. He is either greatly depressed or highly elated, and has an abiding conviction that he is soon to be called to render up his accounts. He believes in faith-cure and Christian science, yet he is the constant patron of his family physician, thanks to his faithful wife. Poor woman! She warms his shoes for him every morning, for fear they may be a trifle damp. She gets all his clothing ready, so he may jump into them quickly without too long exposure of the body to the air. She feels of his head for fear it may be too hot, and chafes his feet that the circulation may be good for the day. The poor careworn, anxious wife declares "he is so delicate," and he, the fool, thinks he is. Now what is the diagnosis in this case? She fusses too much! If such men had no one to fuss over them, they would become strong and well within three months. We often write of the nervous hysterical woman; but deliver us from the grunting man spoiled by the mistaken kindness of a devoted wife.—*National Medical Review*.



Diphtheria Conveyed by Milk.

Dr. Hunt, of the New Jersey State Board of Health, has reported upon the outbreak of diphtheria occurring at Hightstown in that State. He found that eighteen of the twenty cases investigated were in families supplied by the same milk man, in whose employ was a lad suffering from diphtheria, but at work in the dairy. The general sanitary condition of the town was good, and had no part in the epidemic.—*B. M. and S. Jour.*, August 10, 1893.

Underground Water and Typhus Fever.

In an excellent essay which received the prize offered by the National Academy of Medicine of Mexico, Luis E. Ruiz and Fernando Zarraga (*Gaceta Medica de Mexico*, Vol. xxix, p. 49) arrived at the following interesting conclusions: From November 18, 1890, to September 14, 1891, there was a correspondence between the oscillations of the amount of the underground water and the frequency of typhus fever. When the ground water got lower the number of typhus fever cases increased, and *vice versa*.

Why Bathing Soon After a Meal is Dangerous.

M. Wertheimer, in speaking before the Paris Academy of Science, developed some facts which it will be well to bear in mind during the present bathing season. He showed that a sensation of cold on the skin acts on the circulation of the lower part of the trunk, that is to say, the veins, and also on the brain, in the same way as a mechanical or electric stimulus of the sensitive nerves of the skin. This observation affords an explanation of the fact that a sudden immersion of the body in cold water after a meal, and while the process of digestion is going on, may be attended with danger. At this time the abdominal system is the seat of an intense physiological congestion, and the accumulation of blood in it is suddenly thrown back towards the nervous centres. The consequence may be a disorder resulting in death.—*E.v.*

International Sanitary Conference.

The *Journal de Médecine*, Paris, June 25, says that the International Sanitary Conference on the measures to be taken against cholera will be held late in the autumn in Paris, to examine questions relative to the oriental countries.

Do the Sick Ever Sneeze?

"Do those who are seriously ill ever sneeze?" This is a point alluded to by Mr. Jonathan Hutchinson in the January number of his *Archives*. He does not recollect himself to have seen any but fairly healthy persons sneeze. He puts the question with especial reference to the widely spread popular superstition that sneezing is a sign of health and good luck. It is possible, he thinks, that this may have had its origin in the fact that it is for the most part an act restricted to those in fair health. Tylor, in his "Primitive Culture," gives interesting facts as to the prevalence of this creed as to certain customs associated with it and traces it in part to doctrines of animism, but Mr. Hutchinson thinks the suggestion he has given may also have some value.—*Sheffield Medical Journal*.

Mid-ocean Air.

In an article published in *The Clinique*, Dr. Frank J. Thornburg records the following: "Upon the fact of the absence of bacteria in the air of mid-ocean I convinced myself in a recent transatlantic voyage. While still in the harbor of Antwerp, bacilli were present in the air, varying in number from three to five hundred per cubic metre, as determined by aspirating the air through large glass tubes. Sailing down the Schelde River the number decreased to two or three hundred, and in the North Sea almost no germs were present. Upon entering and sailing through the English Channel, the observations revealed the presence of bacteria in the air varying from one to three hundred per cubic metre, although in the wider parts of the Channel the number detected on exposed gelatin and agar plates was much less. Beyond the Scilly Islands the bacteria gradually diminished and in the Atlantic Ocean from five to forty degrees west longitude no germs at all were present."—*Western Medical Reporter*.

Immunity in Diphtheria.

The experiments which Behring, in the Institution for Infectious Diseases, and Aronson, in the Laboratory of the Agricultural College, Berlin, are conducting with the object of providing a serum, or a product from serum, which can be used in convenient doses for the treatment of diphtheria, have been attended with a very considerable degree of success ; but it appears that there are great difficulties in raising the degree of immunity sufficiently high and at the same time preserving the animals in health. There can, however, be little doubt that sooner or later the zeal and talent of these experimenters or some of their fellow-workers in the same field will be rewarded, and that we shall have, in a convenient and reliable form, a specific remedy against one of the most fatal diseases.

Meat Eating and Bad Temper.

One deplorable result of excessive meat eating is the ill-temper which is said to be the chronic complaint in England. "In no country," declares Mrs. Ernest Hart in the *Hospital*, "is home rendered so unhappy and life made so miserable by the ill-temper of those who are obliged to live together as in England. If we compare domestic life and manners in England with those of other countries where meat does not form such an integral article of diet, a notable improvement will be remarked. In less meat-eating France urbanity is the rule of the home ; in fish- and rice-eating Japan harsh words are unknown, and an exquisite politeness to one another prevails even among the children who play together in the streets. In Japan I never heard rude, angry words spoken by any but Englishmen. I am strongly of opinion that the ill temper of the English is caused in a great measure by a too abundant meat dietary, combined with a sedentary life. The half-oxidized products of albumin circulating in the blood produce both mental and moral disturbances. Brain-workers should live sparingly if they would work well and live long. Their force is required for mental exertion, and should not be expended on the task of digestion, for 'they should remember that the digestion of heavy meals involves a great expenditure of nerve-force.' The healthful thing to do is to lead an active and unselfish life, on a moderate diet, sufficient to maintain strength and not increase weight."

Indian Centenarians.

A traveller visiting recently the Wakoya tribe of Moquis Indians (who number less than 200 souls), reports in *Harper's Bazaar* fifteen centenarians. Each individual's age record is scrupulously kept on a particular horn by punching in it a hole at every birthday. On one of these horns, belonging to an almost mummified but not wholly decrepit old woman named Watsuma, the visitor was permitted to count the holes, which numbered 184, representing the years of her life.

Notification of Croup.

"Membranous croup will hereafter, in New Hampshire, be included in the list of quarantinable diseases. It will be the lawful duty of physicians to report every case of membranous croup to the local board of health."

So says the State Board of Health of New Hampshire in a lately published circular of instructions. The circular also says:

"Many observers now believe in the pathological identity of membranous croup and diphtheria. At all events it is much the safer course to regard all throat and laryngeal conditions accompanied by membranous deposits as diphtheria, and to exercise the same sanitary precautions that are required in the management of the latter disease. The frequent appearance of diphtheria and membranous croup simultaneously, in the same family or community, is one evidence of the identity of the two conditions. The death returns in New Hampshire for the past eight years show that, upon the average, 'croup' causes one half as many deaths as diphtheria, appearing simultaneously with the latter and under the same local conditions and circumstances. The infectious character of membranous croup (laryngeal diphtheria) has been witnessed by many observers. It, therefore, becomes the duty of physicians and health officers to take the same sanitary precautions in a case of membranous croup that they are instructed to observe in a case of diphtheria.

"Local boards of health must quarantine every case of membranous croup reported, placard the premises, prohibit public funerals in cases of deaths from this disease, see that at the proper time disinfection is carried out—all in accordance with the instructions embraced in a circular issued by the State Board of Health, on the Prevention and Restriction of Diphtheria."

Where Consumption is Unknown.

At Bogota, which is situated nearly under the equator, and has an altitude of 9000 feet, consumption and pneumonia are unknown. The winter temperature is 59° F., and the spring and summer 59.5° . Dr. Remondino, in his recent work on the "Mediterranean Shores of America," says that at Janja, in Peru, 79 per cent. of all cases of consumption are cured. The altitude of this place is 8000 feet above the sea level, and the temperature is between 50° and 60° F.

Alcohol and Insanity.

The continued use of alcohol produces insanity by getting up a subjective morbid condition of the nervous system, which misleads the mind and conduct. It is needless to add that after an inebriate is cured he must avoid his old environment of the saloon and be a total abstainer. If he entertains the delusive idea that he can stay in his old environment and drink beer, ales and light wines in moderation with impunity he will have a relapse of his disease of dipsomania. Those who honestly desire to be cured are those who coöperate with the physician in his endeavor to cure them and choose a new environment. Those who are half-hearted about it return to the old environment and relapse.—*Brooklyn Medical Journal*.

Milk Conveying Diseases.

In the most recent French work on milk the question of the transmission of scarlet fever, tubercle and other communicable maladies by milk is fairly discussed, and the evidence marshalled. The action of different microbes on milk is instructively displayed. Experimental pathology and clinical observation have done their work, and allow no room for doubt as to the transmissibility of tuberculosis by affected meat and milk from cows to man. Thoroughly aroused at last, the London Common Council is about applying to Parliament for powers to inspect all animals supplying milk to the metropolis and slaughter such as are found infected. They apply, in short, for the same powers that Edinburgh and Glasgow already enjoy, and which are rapidly stamping out the infection within their radius of influence.—*American Analyst*.

Bactericidal Power of the Nasal Mucus.

Wurtz and Lermoyez communicated to the Société de Biologie, July 15, of the current year, an interesting memoir on the above subject. According to these observers, the nasal cavities normally contain microbes in contact with the mucus secreted by the epithelium of these cavities. It is important to prove that this mucus constitutes a real barrier of defense. This mucus possesses marked bactericidal power, especially for the microbe of anthrax, but also for other species of bacteria. These authors thus explain why living foreign bodies, brought by the inspired air into contact with the mucous membranes, do not more frequently give rise to colonies of microbes.—*Le Progrès Méd.*, July 15, 1893.

McGill University, Montreal.

The chair of pathology and public hygiene in the medical school has recently been endowed by a gift of \$100,000. The donor, who is also the chancellor of the university, is Sir Donald A. Smith. About ten years ago he inaugurated an era of benevolence in favor of medical teaching in Canada by making a semi-centenary donation of \$50,000. Other funds have flowed into the same coffers during the last year, of which \$60,000 from Dr. Molson has been set apart for a building fund for the chemical and pathological departments. Dr. Adami, formerly of the University of Cambridge, has been inducted into the chair of pathology and hygiene.—*New York Medical Journal*, June 17, 1893.

Laugh.

Learn to laugh. A good laugh is better than medicine. Learn how to tell a story. A well-told story is as welcome as a sunbeam in a sick-room. Learn to keep your own troubles to yourself. The world is too busy to care for your ills and sorrows. Learn to stop croaking. If you cannot see any good in the world, keep the bad to yourself. Learn to hide your aches and pains under a pleasant smile. No one cares to hear whether you have the earache, headache, or rheumatism. Don't cry. Tears do well enough in novels, but they are out of place in real life. Learn to meet your friends with a smile. The good-humored man or woman is always welcome, but the dyspeptic or hypochondriac is not wanted anywhere, and is a nuisance as well.

Obesity and Life Insurance.

Dr. Kirsch has studied the question of obesity in connection with life insurance. Ordinary obesity is not a reason for refusing a policy. If obesity is hereditary, if in the family history there has been diabetes mellitus, or cerebral hæmorrhage, the medical expert should be cautious. If obesity is extreme the heart and urine should be carefully examined. Irregular pulse and bradycardia are bad signs. When intemperance coincides with obesity the probability of long life is small.

Modern Samsons.

A large number of physicians were recently invited to witness the alleged miraculous feats of strength performed by an exhibition "strong man" in this city. We can hardly believe that many of the medical audience were greatly astonished at the performance. The man is undoubtedly very strong and has an interestingly huge muscular development. But the feats which he performed was not so very much beyond what amateur athletes can do. The lifting of a "human dumb-bell," *i.e.*, an iron rod with a small man at each end, is accomplished partly by a trick of strength well known by those who practice this kind of exercise. The supporting of two small horses and a very small pony on a platform was also more ingenious than masterful. It is unfortunate, at least from the medical standpoint, that the man does not go through some straightforward tests that would show in a more exact way how much he exceeds the average man in muscular power. Thus the experiments of Rey and Maréchal show that a man in good health has a power of hand pressure equal to forty or fifty kilogrammes and a force of prehension equal to one hundred and thirty-two kilogrammes.

The following are the measurements of the man, and given out as correct: Neck, $18\frac{1}{2}$ inches; biceps, $19\frac{1}{2}$ inches; forearm, 17 inches; chest, normal, 52 inches; contracted, 46 inches; expanded 58 inches; waist 29 inches; thigh, $26\frac{3}{4}$ inches; calf, 18 inches; height, 5 feet $8\frac{1}{2}$ inches; weight, 199 pounds.

The most extraordinary of these figures are the chest measurements. The average man weighing 145 pounds, 5 feet 8 inches high, has a chest measurement of only about 34 inches. The measurement of professional athletes and pugilists rarely goes much above 40 inches.—*Medical Record*.

To Supplement the Trained Nurse.

A new form of training has been undertaken by the Massachusetts Emergency and Hygienic Association—namely, the opening of a new occupation for young women who desire to become attendants upon chronic invalids, aged persons, convalescents and sickly children. There are many families where it is inexpedient or impracticable for the relatively well members to wait upon those other members who may be feeble or sick. The trained nurse's attentions are a step above what are required in such cases, and are, perhaps, too high-priced for a long-continued service, as in the case of a confirmed invalid. It is at the time when the trained nurse takes her departure that the trained attendant may often do much good. And some discipline and instruction will make the latter fit to take up the work of the former.—*New York Medical Journal.*

The Prevention of Disease.

Recent studies by Dr. T. Mitchell Prudden have shown, as most educated people well know to-day, that this whole class of formidable diseases is caused by minute organisms which enter the body from without, and, each after its kind, poison or kill. It is a long and sinister list, with consumption or tuberculosis at the head. In its train follow pneumonia, diphtheria, scarlet fever, typhoid fever, cholera, small-pox, measles, typhus fever, yellow fever, malaria, and more of the devilish brood.

Twelve years ago we knew practically nothing of these invisible enemies, the pathogenic germs, which, nevertheless, carried off prematurely and under untold suffering a large part of the human race. To-day some of them are present at the roll-call in every well-furnished bacterial laboratory; their pedigrees, their lurking-places, and their habits are as distinctly matters of record as are those of larger criminals in statelier prison-houses. To-day we know something of the stories of nearly all of them, and of many how they produce their dire effects in the body; we know the conditions under which they thrive; we know how, outside of the body at least, they can be killed. Now and again it has seemed as if the veil were parting, and we could catch glimpses of a time not far off when we shall be able to battle

with these intruders, even in the body, when their ravages are already under way.

But as yet the great practical results of this decade of discovery lies not so much in the power which we have acquired to cure, as in the power to prevent, bacterial disease. We have learned that in a large number of bacterial diseases the inciting germs have no breeding places outside the bodies of those men or animals which are their victims, and that if all materials thrown off from these be at once destroyed by heat, by fire, by chemicals, or in any other way, all danger of transmission is removed.

In regard to such diseases, then, as typhoid fever, cholera, diphtheria (and in large measures the same is true of consumption and pneumonia), our point of view has entirely changed. They are not inevitable accidents, even under the complex and in many ways unfavorable conditions of life in crowded communities. When to-day we hear that this or that useful citizen has fallen by the way, stricken with typhoid fever, or when diphtheria claims the light of the household, we know that ignorance or carelessness, be it private or official, is alone to blame. We cannot always, we cannot often, trace the fault, so complex are the conditions of modern life. It may be the milk-dispenser, it may be an inefficient street-cleaner, it may be a polluted water supply, or the filthy folly of trailing skirts along the streets, which has brought the germs to the victim. They are sown by indiscretion, and fostered always by ignorance and neglect. Diphtheria claims yearly in this land its hundreds of thousands of child victims, uselessly sacrificed on the altars of public apathy or private indolence. A conservative comparison and estimate shows that in the State of Michigan alone, during the three years, 1886-88, at least 10,000 cases of diphtheria were probably prevented, and more than 1700 lives saved by intelligent isolation and disinfection.—*June Century*.

Cycling.

Dr. A. D. Rockwell says that cycling, like all other methods combining healthful exercise with pleasure, can be abused, but taking it all in all he regards the bicycle as a most beneficent invention. He has seen great benefit to mind and body come from its judicious use.

The Fruits of Sanitation.

Considerable improvement in the public health has followed the hygienic awakening of Italy, as seen in a report of Dr. Panizza, which has been recently issued by the government. While the general death rate for the whole kingdom was 28 per mille in 1887, in 1888 it had fallen to 27.5, and in 1889 to 25.6. In spite of the ravages of influenza in the two following years, the death rate only rose to 26.4 in 1890, and 27.2 in 1891. The statistics of infectious disease show a diminution in the five years, 1887 to 1891, equal to 43.17 per cent. Taking particular diseases, we find that while small-pox caused 16,249 deaths in 1887, it claimed only 2,915 victims in 1891. For measles the corresponding figures were 19,545 deaths in 1891, as against 23,768 in 1887; for scarlet fever 7,254, against 14,631; for diphtheria 11,691, against 24,637; for typhoid fever 18,938, against 27,273; and for puerperal fever 1642, against 2504, being a total of 61,985 deaths from infectious diseases in 1891, against 109,062 in 1887. These gratifying results, which may be called the first fruits of the new sanitary law, may be accepted as of excellent augury for the future.

Bathing After Excessive Exercise.

The popular notion of the injurious effect of a cold bath taken by one who is overheated from exercise must possess—as all such ideas have—some basis in experience; and yet it is falsified by the experiences of athletes from the days of the Greeks and Romans even until now, who find in this procedure a refreshing and stimulating tonic after the exertion they have recently undergone. And, physiologically speaking, a cold plunge or douche taken immediately after the physical effort, when the skin is acting freely and there is a sense of heat throughout the body, is as rational as in the experience of the athlete it is beneficial. It is paralleled by the tonic effect produced by the cold plunge when the skin is actively secreting after a Turkish bath, and finds its rationale doubtless in the stimulation of the nervous system, in the increase of internal circulation, and also in the renewal of activity to the cutaneous circulation after the momentary contraction of blood-vessels due to the cold. The popular

belief doubtless rests on the injurious effects which may be induced by the bath in one who does not resort to it immediately, but allows time for the effects of fatigue to show themselves on the muscles and nerves and for the surface of the body to get cool. Taken then the bath is more likely to depress than to stimulate, there is less power of reaction and greater liability to inflammation. At such a time a warm bath rather than a cold one is more suitable and more safe. It has been suggested, however, that the practice of indulging in a bath after violent exercise may initiate renal disease. Of this there is no evidence. The transitory albuminuria observed after prolonged cold baths may indicate the disturbance in the renal circulation which ensues upon them, but these cases are in a different category from those to which we are now alluding, nor are we aware of any facts to prove that, even in them, Bright's disease has been developed in consequence of the transient departure from the normal. Lastly, it must be remembered that those indulging in athletic exercises of all kinds are presumably sound in heart as well as limb, and that such persons may take with impunity, and, indeed, with benefit, measures which would be distinctly harmful to the weakly.—*The Lancet*.

How To Breathe Properly.

Most people breathe properly, often more by accident than by design ; but, on the other hand, hundreds of thousands do not breathe properly, while many thousands at this present moment are suffering from more or less severe affections of the throat or lungs, owing to a faulty mode of respiration—in other words, because they breathe through their mouth instead of their nostrils. The mouth has its own functions to perform in connection with eating, drinking and speaking ; and the nostrils have theirs, viz., smelling and breathing. In summer time the error of respiring through the mouth is not so evident as in the winter season, when it is undoubtedly fraught with danger to the person who commits this mistake. If any one breathes through the natural channel, the nostrils, the air passing over the mucous membrane lining the various chambers of the nose becomes warmed to the temperature of the body before reaching the lungs ;

but if he takes in air between the lips and through the mouth, the cold air comes in contact with the delicate lining membranes of the throat and lungs, and gives rise to a local chill, frequently ending in inflammation. Many persons, without knowing the reason why they are benefited, wear respirators over their mouths in winter, if they happen to go out of doors. By doing this they diminish the amount of air which enters between the lips, and virtually compel themselves to breathe through the nostrils. But they could attain just the same result by keeping the lips closed, a habit which is easily acquired, and conduces to the proper and natural way of breathing. We believe that if people would only adopt this simple habit—in other words, if they would take for their rule in breathing, “Shut your mouth!” there would be an immense diminution in two classes of affections, viz., those of the lungs and throat, which count many thousands of victims in this county in the course of a single year. Man is the only animal which has acquired the pernicious and often fatal habit of breathing through the mouth. It commences in childhood, and becomes confirmed in adult life, often engendering consumption, chronic bronchitis, relaxed sore throat, or some other disease of the lungs or throat which is set down, usually, to a different cause altogether. In concluding this short article, we venture to ask our readers to judge for themselves. When they step out in the morning into the fresh, but cold air, let them try the difference of feeling arising from the two modes of breathing—through the nostrils and between the lips. In the former case they will find that they can breathe easily and freely, yet with comfort, while the fresh air, warmed to the temperature of the body by its contact with the nasal mucous membrane, is agreeable to the lungs; in the other case, if they draw in a few inspirations between the parted lips, the cold air, rushing in direct to the lungs, creates a feeling of coldness and discomfort, and an attack of coughing often comes on.

The Great Enemies of Man.

The change in the conception of tuberculosis, produced by a discovery of its true cause, calls for a reconstruction of many of the heretofore approved statistics of mortality. It is not very long ago since text-books stated that tuberculosis, meaning espe-

cially pulmonary consumption, affected most often persons between the ages of fifteen and thirty years. The tubercular infection is now known to be most frequent as a cause of death in infancy. At this time it is the mesenteric and other lymph-glands and the meninges that are involved ; in childhood the bones are prone to be attacked, in adult life the lungs.

Taking tuberculosis in every form as a cause of death, Professor Hugo Holsti, of the University of Helsingfors, has compiled interesting facts showing the relation of age to this disease.

During the years 1882-1889 there died in the Swede-Finnish district of Helsingfors 1771 persons, of tuberculous diseases. The mortality rate per 10,000 living persons is much the greatest during the first two years of life (2.5 per cent.). It rapidly falls until, between the ages of six and fifteen, it hardly exists (about .15 per cent.). It then steadily rises until the decades thirty-one to forty, forty-one to fifty, and fifty-one to sixty, where it remains at about .6 per cent. and then falls again.

Males are more subject than females in the proportion of 990 to 781, but this holds true more for adult than infant life.

Professor Holsti's tables show in a striking way identity of the period of greatest mortality from tuberculosis with the time when children are fed on milk.

May it not be that after all the cow is the great enemy of mankind, and that without the cow there would be no tuberculosis? The history of Japan, which is a cowless country, favors in a measure this view. Science seems to be pointing toward the conclusion that there are two great and potent poisons constantly diffused among civilized peoples, and these are milk and water. Not that these substances are essentially bad, but that they are accidentally so. It is not proposed to abolish, but to purify them.
—*Medical Record.*

Taking Stock of Health Resources.

Every one born healthy into the world brings an endowment of vital capital sufficient to maintain the body for normal and efficient service, say, for eighty years. This capital serves two purposes, or rather a common one, in two ways. Its income is large enough, and probably somewhat more than enough, for all healthful drafts till maturity ; there is provision for the expenditure of the periods, fairly well defined, of infancy, childhood, puberty, maturity and old age, and it seems to be true that

economy at early periods saves for those that follow, but such saving is not likely after maturity is reached. It is in accord with other matters that strength comes by effort, power in natural law in one form by its exercise in others, in the use of vital capital, provided that it be in line with the purposes of the bod.

In our present view the cost of living—the outlay for mental or physical work—is met by draft on this fund. To think, to decide, to do, we draw upon income first, and, if we will, sometimes from the capital. In the normal life of infancy, childhood, youth (and early manhood, perhaps), the principal draft is for growth and development of powers; and the normal expenditure for these purposes is greater at these ages than afterward. At and after maturity, the draft is for current expenses—living and repair and for special work. With health and a normal record to date, this charge should be easily met from income, but it is a fact that many have “lived beyond their means,” and have in various ways drawn on capital which, according to its extent, impairs income and threatens vital bankruptcy, and this may exhibit itself in physical or mental weakness and end in premature death. Both results are in common evidence.

In the way of nature, old age should find one with scarcely diminished vital capital yielding no more income, but sufficient to take one by easy and enjoyable stages of physical rest and mental occupation to the age of at least eighty years, and to euthanasia, the normal end of a happy life. I think it not difficult by this rude but not unfair analogy of the methods of using pecuniary capital and income, to throw some valuable light on the facts of failure or success in managing vital capital, by all sorts and conditions of men. Why would it not be a judicious and business-like act, then, once a year “to take stock,” figure the profits and losses of the twelve months’ living and doing that are passed, and learn what one may of the vital prospects ahead of him? It will lead to discoveries worth making, and one of the first will be the fact that the body is endowed with delicate methods of its own, independent of the mind, of discovering and determining the kind, direction and amount of the response to make to the demand upon its resources, from within or without itself. You will find it a serious mistake to think the mind absolute master of the body, or the last nothing but the creature of the first.—*Dr. C. N. Hewitt, in the Literary Northwest.*

Mortality of Tennessee Prisoners.

Dr. P. D. Sims, of the Tennessee State Board of Health, made the following statement in a paper read at the National Prison Association, and reproduced in the Tennessee State Board of Health *Bulletin*, July 20, 1893. We are credibly informed that the condition of affairs in North Carolina is much the same as in Tennessee:

"I have been for a number of years a member of the Tennessee State Board of Health. Eight or ten years ago the chairman of our Prison Committee left the board, and I was made chairman of that committee. I began to investigate the question. It had generally gone along as such matters do, with a careless supervision, but I thought it my duty to look into it, and give it a close investigation. The first thing I did was to investigate the prison reports, to see what they were doing. My attention was at once attracted to the great mortality in the prison. We were sustaining a mortality of seventy-seven per 1000 per annum, while the mortality of some of our branch prisons ran up to 100 per 1000 per annum. That struck me as being inordinately large, but as I was not conversant with the management of prisons I began writing to various prisons throughout the country for their reports, to ascertain what their mortality was. In this investigation I found the average mortality in all lease prisons to be 60.4 per 1000, and that the mortality in non-lease prisons was 15.1 per 1000, exactly one-fourth that of lease prisons. I made up my mind at once that whatever there might be of good in it, we could not afford to maintain the system that was killing four times as many as other systems. We have no right to take men's lives in our efforts to reform them or protect society. Society has a right to protect itself against the evil doer, but the best way to do that is to convert the man or woman from an evil doer into a doer of good; to convert a destructive member of society into a constructive member of society. All of that is lost sight of in the lease system."

The Berlin Sewage and its Lessons.

The *Cosmopolitan* for July contains an interesting article by Mr. Poulteney Bigelow on "How to Make a City Cholera Proof." We extract the following:

"In the summer of 1887 I was taken over the great sewage farms about six miles from Berlin. I was accompanied by the

bacteriologist, Dr. [Koch, who let fall the remark that, in his opinion, Berlin was proof against an epidemic, owing to the manner in which her sewage was carried away and rendered innocuous.

The great cholera epidemic came and paralyzed the commerce of most of the seaport towns of Europe, devastated Russia pitilessly, and left the great city of Hamburg more impoverished than when the troops of Napoleon evacuated it.

Berlin looked upon the progress of the plague with equanimity, although she is on the highway between Hamburg and Russia and daily exposed to an attack because she lies upon a river connected by means of canal, not only with the waters of Hamburg and Russia, but of an infected port on the Baltic, Stettin. Her hospitals accepted, as a matter of course, the isolated cases of cholera that occurred in her neighborhood, but there was at no time anything approaching to an epidemic within her walls.

The experiment made by Berlin in utilizing her sewage by making it enrich the sandy soil of the neighborhood has proved so successful, is so simple, so inexpensive and so well suited to the needs of New York that a few words of description may not prove uninteresting.

The present system of cleansing Berlin has been tested by nearly twenty years of thorough experience.

Berlin, for scavenging purposes, is divided into districts. A huge cesspool in each collects all the sewage in that particular district, and this sewage, by means of powerful engines, is uninterruptedly pumped off, far out of the city, on to land specially prepared for this purpose.

I visited the Blankenburg farm of 2700 acres. The road along which we walked was deep with sand. On either side of us, however, were fields rich with a most luxuriant growth, which, but for the irrigation to which they are subjected, would be as fruitless as the road on which we walked.

There were, in the official year 1885, some 10,000 acres under irrigation for a variety of purposes, including experimental agricultural purposes, nurseries and flower raising. The staple crops, however, were summer and winter rape, mustard, hemp, winter and summer rye, oats, Indian corn, barley, buckwheat, peas, beans, clover, grasses, potatoes, beets, cabbage, chicory and turnips. Cereals alone took up nearly 4000 acres.

In its original condition, that is to say, before the city of

Berlin adopted the present method of cleansing itself, this land was worth \$182 per acre. As soon, however, as sewage is applied to it, the value rises to over \$400 per acre.

The dreariest stretches of sandy Long Island are picturesque, if not luxuriant, in comparison with the country about the German capital. Yet on this soil are now being raised crops that would astonish an Iowa State fair.

Learned lights of the German scientific world had gravely told their hearers that for one year, two years, possibly three years, the system might work; but that the time must speedily be when the soil would contain so much sewage matter as to not only make vegetable growth impossible, but to poison the air and water of the whole surrounding country. But the managers of the sewage farms have found that they have no difficulty in adapting their crops to the strength of the soil. In other words, they can exhaust as fast as the city can restore.

Another great source of alarm was lest the drainage from the irrigated fields should poison the waters of the neighborhood. So serious was this feeling among all classes that a law was passed making it punishable, by a fine, for any one to drink from the waterways near any of the sewage farms.

Dr. Koch, the authority on bacilli and disease germs, told us, on the spot, that before disease germs could propagate themselves in Berlin they were hurried off on to this soil, which is completely destructive to bacilli. The six hours that intervene between bacilli entering the drains of a Berlin house and reaching the ditches of the sewage fields, are not enough to give the disease a start.

The water offered me had entered the sewers of Berlin only six hours before. The only cleaning it had received was in percolating from the irrigated field into the ditch that surrounded it. So effective, however, is this, that my drink was not only as clear as pure spring water, but the taste was as though it had been distilled—a taste familiar on shipboard. And not only was this water free from odor, but the air on and about the irrigated fields was not tainted to a point that could be called offensive.

The sewage is so largely cleansed by the mere passage through six miles of pipe that, after it has been a short time upon a field, the odor is hardly noticeable. The complaints from neighboring farmers, which at first threatened to wreck the enterprise, have quite ceased.

So great is the demand for "sewage vegetables" that the market people are clamoring to have a special section reserved for this growth alone, alleging that in that way they can get higher prices for these particular vegetables.

For the twelve months between March, 1885, and April, 1886, the cost of cultivating 9194 acres was \$134,778, while the income from the same was about \$271,000, being a profit of over \$136,000, or about \$32.50 for each acre. This profit is calculated without reference to the general and official expenses and interest on capital. Counting, however, all possible charges, the profit still amounts to an average of \$18.50 to the acre.

We all know that more danger to the public health arises from the sewers than from any other cause, and that therefore scavenging as a profession must be a dangerous one. But the system under which Berlin purifies herself is happily freed from the ill-effects attending all others.

The several estates making up the total area of the sewage farms were supporting last year 33,749 souls. Out of this number there were 237 cases of illness, the causes of which are interesting to note.

To apply the lesson of Berlin to our requirements it would be necessary :

First.—To acquire enough land between Whitestone and Coney Island to enable the city to lay out fields suitable for irrigation, and enough of them to meet the anticipated increase in the population.

Second.—The sewage of New York island, instead of being turned into the surrounding waters, would then be collected at a dozen points on the east side of the town, between the Harlem and the Battery.

Third.—From these points of reception it would be pumped off, night and day, by means of powerful engines, through suitable pipes, out on to the city farms. None of these farms need be more than ten miles from its particular pumping station. One pipe line, for instance, might lead from the foot of Fulton street out in the Flatbush direction. Another, from the foot of Tenth street, could work the Jamaica neighborhood. Several pipe lines could cross the East River at Blackwell's Island and enrich the Flushing neighborhood, which now pays such heavy taxes for manure.



COMMUNICATIONS.

Lectures on Hygiene.

BY SENECA EGBERT, M D.,

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LECTURE IV.

WATER.



EXT to air, water is the most important of all substances necessary to human life. We must not only have enough to supply internal wants of the body and to replace that lost by excretion, but we need a plentiful supply to maintain cleanliness of bodies, clothing and dwellings and to remove sewage, excreta, etc., from the vicinity of our habitations. The care of furnishing water in abundance and of maintaining its purity is thus strictly within the domain of the sanitarian.

Although the average adult requires only from 70 to 100 fluid ounces per day for nutrition alone, and though ordinarily less than a gallon is needed for the preparation and cooking of food, we still must not forget that cleanliness is an essential requisite for the maintenance of health, and that every facility must be provided for removing filth of all kinds from persons, dwellings and clothes, and for this a fair supply of water is needed. The best authorities agree that about twenty-five gallons per head per day should be supplied for the above purposes, and if to this be added that required for animals, manufacturing establishments, municipal needs, etc., forty, fifty or even

more gallons will be the average daily individual requirement for a community. Fortunately there is not much difficulty in supplying this amount almost anywhere in this country, and the tendency is rather toward wastefulness in the other direction. The aim of the authorities should be to furnish a reasonable abundance of *pure* water, and this only should be supplied to dwellings. If more is needed for factories, city uses, etc., this may often, for economy's sake, be of a somewhat inferior quality.

Practically, all water has at some time or other fallen upon the earth in the form of rain, snow, hail or dew, but when we speak of the sources of our drinking water we have reference rather to the places or localities from which we collect it. The rain, etc. on reaching the earth is disposed of in three ways, according to circumstances of time, place, character of soil, etc.; part at once evaporates, part flows off according to the slope of the ground and part sinks into the soil. Consequently we take as the sources of potable water: (1) Artificial collections of it as it falls as rain; (2) pools or streams that receive it as it flows over the surface; (3) collections held in the porous and water-bearing strata of the earth, and (4) springs caused by the outcropping of these strata below the level of the water line.

Rain-water is theoretically the purest at our command, but in reality it takes up many substances, both solid and gaseous, in its descent through the air, while, moreover, the surface on which it falls is apt to be covered with dust and dirt of all kinds, especially after continued dry weather. These various impurities render the first portion of rain that falls unfit for use, and this should be discarded; the remainder, if filtered and stored in proper receptacles, may be of excellent quality. The collection may be from roofs or from a special area covered with cement or slate, and with conduits leading to a filter and cistern.

The grave objection to the use of rain-water is that dependence must be placed upon a very uncertain source, which is especially likely to fail when an increased supply is most needed. Each inch of rainfall is equivalent to 4.67 gallons per square yard, or 22,617 gallons per acre. Taking the average rainfall as thirty inches, the loss by evaporation as 20 per cent. and allowing a collecting area of sixty square feet per individual, the supply would only be about two gallons per day, or but little more than enough for cooking and drinking purposes. (The average rainfall for Philadelphia is about thirty-nine inches, with a possible

variation of one-third for very wet or very dry years.) Rain water, however, is especially valuable for cooking and washing on account of its *softness*, and so should be collected and preserved when the other waters of a locality are *hard*. Water is said to be hard when it contains an excess of lime, magnesia or similar salts in solution; these bases form insoluble soap with fatty acids and are also poor conductors of heat, so that ordinary soaps are wasted in washing and heat in cooking, and the use of hard water is thus uneconomical.

Rain-water should be filtered before passing into the cistern, and the latter should keep the water cool, should receive no rubbish, and should be cleaned regularly and often. It should not be lined with lead, zinc or galvanized iron, on account of the water's great solvent powers, and should not be underground unless absolutely water-tight.

Water from streams *not* polluted by the refuse and sewage from towns, factories and cultivated lands may be fairly pure and safe. The best water of this kind will be from hilly, uninhabited tracts traversed by many small streams, fed by constant springs, and uniting to form rapid creeks and rivers, though such water may be slightly tinged with harmless vegetable, or mineral matter. For storage, dams may be thrown across convenient valleys, thus impounding the water, keeping it exposed to the oxidizing action of the air, and allowing solid impurities to settle to the bottom. Small lakes and ponds may be also used for a supply, provided they be not stagnant, nor have much decaying matter along the banks. River waters are generally hard, containing the minerals of the soils over which they pass.

River water which has received the sewage from any large town, the refuse of factories, or the drainage from large tracts of cultivated land should be considered as at least suspicious. It is not by any means safe to depend on the self-purification of rivers, though much of the sewage and filth is in time destroyed, part by oxidation, especially in rivers flowing over dams, rapids, etc., part by subsidence or deposition along the banks, part by fish and animalculæ, and much by the pyramids of saprophytic bacteria, which such water always contains. Moreover, if no further pollution is added, there is great dilution of what is left unchanged by the above forces, by the large supplies of pure water which every stream receives along its course; so that, though the water may never become as pure as it was originally, it may by proper

filtration and treatment be made a usable water. But where the proportion of sewage exceeds a certain percentage, or where it is being constantly added to along the stream, the purifying agents soon become insufficient for the task, while there is always present the greater danger from sewage contamination, viz., that these may multiply rapidly in such a medium, and that they may not be removed or destroyed by the usual means of purification. Therefore, as it is doubtful when a water so contaminated becomes safe for use again, and as the sewage pollution increases with the population, the use of such water should be avoided, if possible. Water from fresh water lakes is of the best quality, provided the supply is taken from so far out as to escape all danger of sewage contamination.

That part of rain-water which enters the soil sinks through the ground till it reaches an impermeable stratum, where it is retained in natural basins, or else escapes at some out-cropping of the stratum below the water level, thus forming a spring. The level of water in these underground reservoirs is constantly changing, according to the season, rainfall, discharge from springs, etc., though the variation in level is usually regular, and about the same from year to year. It is from wells sunk to these water-bearing strata, and from springs fed from these basins, that most of the population living in small towns and rural districts receive their water supply. These underground bodies of water are constantly moving towards outlets at some point or other, but the current is very slow, owing to the friction and capillary attraction of the soil through which it flows. It is by means of this current that a cess-pool, or other collection of filth, may drain into a well, or contaminate a spring some distance away.

Ordinarily, rain-water that has percolated through the soil for a considerable distance is remarkably pure and wholesome. It soon loses by filtration the impurities it received from the air and the surface on which it fell, though it may take up some of the mineral constituents of the different soils through which it passes. When the quantities of these mineral substances become so great as to give the water a medicinal value, or marked taste, we call it a mineral water; but when the inorganic matter does not render the water objectionable to the taste, or too hard, it will probably be found to be purer than that from almost any other source. This does not hold good for ordinary wells, or where the water passes almost directly from surface to outlet, for in

either case the prolonged filtering action of the soil is lost. Wells drain an area in ordinary soils whose radius is at least four times the depth of the well, and there are few wells about which such an area is not subject to dangerous pollution. Especially about human dwellings are impurities apt to be carried into the well, for dirt of almost every kind is constantly increasing in quantity in the soil about a house, with always the possibility of disease germs being added thereto. Only soluble impurities may reach the water, together with bacteria which pass freely through almost all soils, and many waters thus polluted are sparkling and clear, with even a pleasant taste, and no bad odor, so that all suspicion as to their true character may be wanting. So, also, such water may, perchance, be used for a long time with impunity, and serious symptoms may only manifest themselves when continued dry weather causes a concentration of the impurities by lessening the quantity of water holding them in solution, or when heavy rains dissolve or wash into the well an increased amount of filth from the surrounding soil.

A distinction is to be made between *shallow* wells, which are those under fifty feet in depth which do *not* pierce an impermeable stratum, and *deep* wells. The latter are the better, especially if they be cased about the mouth and upper part of the well, thus causing the water to be filtered by a considerable depth of earth before it enters the well. All wells, however, should have this casing, and should have a good curb to keep out surface splashing. The area about a well should also be kept clean, and all possible sources of contamination removed. The well should be so placed that the underground current flows from it toward any cess-pool or other source of pollution, though often if the well be deeper than the cess-pool it may temporarily drain from the latter against the current when the water in the well is suddenly lowered. The direction of this current may often be determined by noting the location of the nearest spring or water-course toward which the current is probably flowing, or by observing the "dip" of the underlying strata, or, in a doubtful case, a quantity of salt, kerosene oil or aniline dye thrown into the cess-pool will soon reveal its presence in the well if the drainage is in that direction. Well-water should be frequently tested for chlorides and nitrates, these indicating sewage contamination, and this should especially be done after heavy rains or when the water in the well becomes very low. The taste and odor of the water should also be noted,

especially after standing and being heated. Some other source should be sought when these tests show contamination or when cases of infectious disease are near at hand. Wells in thickly-settled towns should not be used, as the surrounding soil is inevitably saturated with filth.

Artesian wells are very deep wells, penetrating several impermeable strata. Sometimes the hydrostatic pressure of the water between two or more of these strata forces it out of the mouth of the well. In such a case it has entered and is retained by the strata at a higher level than the well's mouth. The decision as to the purity of any water must in each case be determined by all the circumstances available and relating to it, and these should be thoroughly investigated, for some may counteract others. Other things being equal, the value of a water will probably be in accord with the following table :

Wholesome :	{	1. Spring-water	{	Very
		2. Deep well-water		palatable.
		3. Water from unpolluted streams		Moderately
Suspicious :	{	4. Stored rain-water		
		5. Surface-water from cultivated land		palatable.
Dangerous :	{	6. Sewage-polluted river-water	{	Palatable.
		7. Shallow well-water		

A good potable water should be perfectly clear, free from odor or taste, cool, well aerated, and, if possible, soft or with only a very mild degree of hardness. Circumstances must determine the amount of dissolved matters permissible ; what is an excess in one case may not be in another. We may also classify water as follows : (1) Pure and wholesome water ; (2) usable water ; (3) suspicious water ; (4) impure water. Waters of the first and second classes may be used without filtration ; those of the third class should be filtered before distribution and also at the house before use ; if possible a purer source should also be sought out, or else all sewage contamination prevented. Waters of the fourth class should not be used at all except when absolutely necessary and then only after purification by all the means at command. Inasmuch as most large cities must of necessity furnish a water of the second and third and occasionally of the fourth class, they should purify the water as much as possible before distribution by subsidence in storage reservoirs, by chemical means when necessary and by some efficient method of filtration.

LECTURE V.

Purification of Water.—Impurities in water may be either solid or dissolved substances. Turbidity is due to suspended matters; water free from these is clear, though it may have a deep color from substances in solution. But a clear water may contain bacteria, parasitic ova, etc., which are too minute to be seen by the naked eye. All impurities, whether solid or dissolved, organic or inorganic, should be removed as far as possible from all supplies of drinking water. This may be done to a considerable extent before the water is distributed to consumers, and should be done by the latter if the water is not already clean within the limits of safety when received.

Purification on a large scale must be attained by the use of one or all of three methods: subsidence, chemical treatment and filtration. The first consists in allowing the water to stand for a time in large reservoirs till the greater part of the suspended matters have fallen to the bottom. Oxidation and saprophytic bacteria also act at the same time upon both solid and dissolved organic matters, and these processes combined do much to purify the water. These reservoirs should be large enough to hold a supply sufficient for any season of drought and the water should also be allowed to stand in them for two or three weeks; there should also be more than one, so that they may be cleansed at intervals without interrupting the supply. It may be stated that often after storms water may contain a finely divided clay or silt that will not settle, even though the water be stored for a long time, and that the same trouble may occur with soot when large quantities have been carried into the reservoirs by melting snow.

If the hardness of water be excessive and due to calcium bicarbonate it may be advantageous to treat it chemically. Clark's process consists of adding a certain quantity of slaked lime (calcium hydrate) to a certain quantity of the water, and this uniting with the calcium bicarbonate forms the *insoluble* calcium carbonate, which sinks and also carries with it other suspended substances in the water. After standing a sufficient time in the mixing tanks the water is drawn off and the precipitated carbonate removed, when the process is repeated. It may also be at times advantageous to add a small quantity of alum to water before filtration, especially where there is the fine silt above mentioned together with some chalk. The chalk and alum form a flocculent precipitate, which carries down with it the

other solid impurities in the water. If the latter be then properly filtered and the proper amount of alum has been added, no trace of alum will be found in the filtrate.

It will doubtless not be going to far too say that in addition to treatment by either of the above processes the water supplied to any large community should be filtered before distribution, since generally such supply must, of necessity, be subject to more or less contamination. Filter beds of considerable area made of sand and gravel are all that are necessary for the purpose, and these have a remarkable cleansing power, acting not only mechanically to remove the coarser solid particles, but also destroying by oxidation and by bacterial action much of the dissolved organic matters. The filters are composed of a layer of gravel, large below, finer above, of from two to three feet in depth and on top of this from one to two feet of sand, angular, but not too fine, and packed rather firmly. On these beds the water is allowed to flow to the depth of one or two feet, under which pressure it filters through the beds at about two gallons per square foot of area per hour and is freed from by far the greatest part of its impurities. The filters are cleaned periodically by scraping off thin layers of the surface together with the collected dirt and washing the remaining sand, more clean sand being added from time to time to replace that removed in the scraping. The layers of gravel need never be disturbed. The power of such filters to remove living organisms is remarkable, though this power is lessened after a time if the filter is not kept clean as above. Magnetic carbide of iron has also been used on a large scale, but, though satisfactory, it does not seem to possess any marked superiority to the sand and gravel. As Professor Stevenson says, however, "The attempted purification for drinking purposes of organically polluted water ought to be deprecated. An essentially bad water cannot be turned into good water by any practically available process of simple filtration."

If all the water supplied to a household be treated as above, there will rarely be need for any additional domestic purification. Unfortunately, however, we cannot rely too much upon the care of those who furnish the water, and additional measures must often be taken at the house to render a water usable or safe. As already stated, many solid impurities may be removed by subsidence, and where possible every domestic filter should have a settling tank connected with it, thus obviating the necessity of

cleaning the filter so often. This subsidence may often be facilitated by adding a little alum and chalk to produce the flocculent precipitate before described. If not more than six grains of alum per gallon be used there will probably be no appreciable or harmful quantity of it remaining in the supernatant waters. Boiling destroys living organisms and disease germs, and all drinking water should be boiled in time of epidemics, or when there is any suspicion of its exposed to infectious germs. It also softens a water due to calcium bicarbonate by driving off part of the carbon dioxide and leaving the insoluble calcium carbonate. Many other mineral substances, among them iron, are thrown down by boiling, the heat driving off CO_2 and thus lessening the solvent power of the water. So, also, organic matters are often gotten rid of by boiling and by subsequent agitation and aeration, which improve the water by restoring oxygen.

Domestic filters are apt to be dangerous, and unless properly cared for may give more impurity to the water than they take from it. What a filter takes from a water is left in the filter unless otherwise removed, and a constantly increasing accumulation of impurities cannot improve the water passing through it. Consequently every house-filter must be cleaned regularly and often, and the size of a filter must limit the amount of work it can do, whatever the materials used. According to Parkes the requisite of a good house-filter are :

(1) That every part shall be easily accessible for cleaning and renewing the medium.

(2) That the medium have a sufficient purifying power and be present in sufficient quantity.

(3) That the medium give nothing to the water favoring the growth of low forms of life.

(4) That the purifying power be reasonably lasting.

(5) That there be nothing in the construction of the filter itself capable of undergoing putrefaction or of yielding metallic or other impurities to the water.

(6) That the filtering material shall not clog, and that the flow of water shall be reasonably rapid.

(7) That the medium be such that it can be readily cleaned and even sterilized, or else so cheap that its removal may not be neglected on account of cost when necessary.

If cleansed at proper intervals such a filter should ordinarily give good water. But as, owing to their minuteness, disease germs

freely pass through most filtering media, the only safeguard against them is to boil the water whenever their presence is suspected. Filters in which the material is cemented up so that it cannot be removed for cleansing or renewal should not be used. Small top filters are insufficient for the work required of them. Sponge, wool, etc. should not be used as they are liable to decompose, give organic matter to the water and cannot be thoroughly cleaned. Block filters are simply strainers and need to be cleansed often; they are practically valuable only when traveling or touring.

The best filtering media are sand, animal charcoal, magnetic carbide of iron, spongy iron, unglazed porcelain, certain porous stones and asbestos. Unglazed porcelain is an excellent medium and, if kept clean, is germ proof. If not cleaned often it is said that bacteria will work their way through it in the course of five or six days. Stone filters may be good, even germ-proof, but are generally slow in action. Sand has fair filtering properties, is cheap and easily cleaned and stops practically all the solid matters besides oxidizing some organic matters. It should be sharp and angular and not too fine, and should be cleaned often by washing and boiling or heating to redness. Crushed quartz has similar good properties. Animal charcoal, when fresh, is an excellent material, as it acts both mechanically and chemically, but after a time it ceases to be efficient and must not be left in contact with the water long, as it will give up organic matter and phosphate of lime, the latter favoring the growth of micro-organisms. A large bulk of it should be used, and it should be changed or cleansed every three months, oftener if the water is very bad. Magnetic carbide of iron and spongy iron are both excellent materials and have considerable oxidizing power. The carbide needs to be frequently aerated; the spongy iron must be kept covered with water. Either may give up a little iron to the water, and neither is much used in this country.

Diseases Caused by Impure Water.—The non-infectious diseases likely to be caused by impure drinking water are primarily those affecting the alimentary tract, as dyspepsias, diarrhea, and any disturbances having their origin in severe gastric or intestinal irritation. This irritation may be caused by either suspended or dissolved animal, vegetable or mineral matters. Iron may cause constipation, lime or magnesia may produce certain dyspepsias, and other minerals their characteristic and poisonous symptoms.

Two other diseases supposed to be due to inorganic impurities in the water are goitre and the formation of vesical calculi, though the true relation of impure drinking water to these diseases is unsettled. The ova of certain parasites, as of the tape or round worm, may be taken into the system with the drinking water containing them.

Of the infectious diseases, germs of malaria, typhoid fever, cholera and dysentery may undoubtedly be carried into the system by the drinking water, while there is the strongest probability as to the same being true of yellow fever, scarlet fever, diphtheria and kindred diseases. In a somewhat recent epidemic, investigated by the writer, the germs from the excreta of a single person ill with typhoid fever found their way into the water supply of and infected a whole village.¹ This patient came while sick to the village, in which there had never before been a case of typhoid fever, first occupied one house and subsequently another, in which he died. It was afterwards proved that he had contracted the disease at his former home. The excreta from this and subsequent cases in the family were thrown upon the soil about the well, the germs found their way almost immediately to the underground water level, and, it is interesting to note, the subsequent cases in the village were almost all directly along the lines of natural drainage from these polluted areas. Numerous other instances showing direct infection by drinking water are reported in Parkes' "Hygiene," Rohé's "Text-book of Hygiene," Pepper's "System of Medicine," and elsewhere. But it is to be noted that, as with impurities causing non-infectious diseases, water containing disease germs may sometimes be used for a long time by those accustomed to it without the development of disease, and it may only be after the system is weakened by excesses or other predisposing causes that the infectious disease manifests itself. Or it may be that only strangers and not the acclimated inhabitants incur the disease.

Regarding the foregoing matters, Parkes gives these conclusions: (1) An endemic of diarrhea *in a community* is almost always owing to impure air, impure water, or bad food. If it affects a number of persons suddenly, it is probably owing to one of the last two causes, and if it extends over many families, almost certainly to water. But as the cause of the impurity may

¹ See University Medical Magazine, May, 1892.

be transient, it is not easy to find experimental proof. (2) Diarrhea or dysentery constantly affecting a community, or returning periodically at certain times of the year, is far more likely to be produced by bad water than by any other cause. (3) A very sudden and localized outbreak of either typhoid fever or cholera is almost certainly owing to the introduction of the poison by water. (4) The same fact holds good in malarial fevers, and, especially if the cases are very grave, a possible introduction by water should be inquired into. (5) The introduction of the ova of certain entozoa is proved in some cases—probable in others. (6) Although it is not at present possible to assign to every impurity in water its exact share in the production of disease, or to prove the precise influence on public health of water that is not extremely impure, it appears certain that the health of a community always improves when an abundant and pure water supply is given; and, apart from this actual evidence, we are entitled to conclude from other considerations that abundant and good water is a prime sanitary necessity.

Ice should not be added to drinking water unless it itself is made from pure water, for the reason that bacterial and disease germs are not all destroyed by freezing. Prudden has frozen typhoid bacilli solidly in ice for over three months without destroying their vitality, and as it is often impossible to know the character of the water of which the ice is made, the danger of contamination is by no means slight. This objection does not hold for ice artificially made from distilled water.

Do Not Remove the Skins.

Dr. Letheby, an eminent English authority on foods, made a series of careful examinations some years ago for the purpose of determining the effects of cooking potatoes without removing the skins. He found that when the potatoes were cooked without removing the skins, the loss of nutritive material by extraction of the juice of the potato was about 3 per cent. When the skins were removed before boiling, the loss was 14 per cent., or one-seventh. It thus appears that removal of the skins before boiling is a very wasteful process, and these experiments explain why baked potatoes are more palatable than boiled. It is also evident that a roasted or baked potato is more nutritious than a boiled potato.

What is Beautiful in Style.¹

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WE may state at the outset, as a fundamental and undisputed law, that every departure from nature is a departure from the beautiful, and that which comes nearest to nature in art is the most perfect and the most beautiful. Man has never yet succeeded in producing anything artificially more beautiful than

that which nature has herself produced, and, indeed, in few instances has he been able to equal nature. It makes little difference when we attempt to modify natural objects, or to distort or alter nature's best works, what additions we make, or what parts we leave off, once we have departed from nature in art. Whatever the alterations they become more offensive to the senses, to the judgment, to the reason, in proportion to the magnitude of the departure from nature.

The law which we claim exists, and always has existed, but which has not been properly recognized or clearly presented, may be stated as follows: *That is beautiful which the eye has become accustomed to see.* In support of the existence of such a law we will offer a few well-known facts.

First, when we see a lady for the first time wearing large hoops, while the rest of the ladies less extreme in following fashion are wearing no hoops, the eye is offended, it looks strange, odd, unsightly, ridiculous. But as we sit at the parlor window, looking out upon the fashionable avenue, and see more and more ladies attired in hoops, spreading wide their skirts, the eye begins to tolerate the innovation. As the days pass on, and we look out and see all the well-dressed ladies wearing hooped skirts, we begin to think them becoming, and, finally, when we see one lady going along without a hooped skirt we are at once converted, and though we had declared at first that we would never wear such a ridiculous costume, we are now ready to say that we would not for the world appear on the street clad in the slovenly and unfashion-

¹ A Lecture delivered to the class in the New Jersey Training School for Nurses.

able attire of this one lady we have seen, who is so entirely without the new style. After a few years, when the leaders of fashion have determined to do away with hooped skirts, and we see for the first time ladies of extreme fashion appearing with clinging skirts and drapery, entirely without hoops, the eye is again offended ; when all have abandoned hoops we find ourselves adopting with pleasure the new style. So again with the bustle. However large the projection, however unnatural, which the fashionable lady puts upon her back, however much it may offend the eye at first, when the eye becomes accustomed to it it is offended at the sight of a dress without that bustle. So, again, when high bonnets are worn we view them with pleasure ; when they are out of style they look horrid. Take also the apparel of the gentleman; when we first see the very broad pantaloons they are as a rule not pleasant to the eye, and are unbecoming. After they are in general use the narrow pantaloons, which previously we thought looked so nice, now look exceedingly ridiculous. The same law applies to the shape of shoes, even to architecture, and lastly, but not least, to the shape of human beings.

Secondly, the group of facts which relate to human beings is as follows: The Flat-head Indians having become accustomed to see the flat head regarded as the most beautiful characteristic of humanity; the African, with a piece of wood two inches in diameter inserted in his lower lip, to make it more projecting, regards this as a point of striking beauty. The Chinese women, with feet so small as to preclude the possibility of locomotion, are regarded as possessing the acme of beauty. Coming down to civilization, and taking the most enlightened and cultured of nations, the French, we find, more unfortunately than even in the barbarians, that the smallest waist that can possibly be produced consistent with life, is regarded as the highest attainment of feminine beauty of form. And not only do the designers of fashion plates attempt to produce the smallest waists, but they also, not alone in France, but in other civilized nations, attempt to lengthen the waist, or in other words to compress the body low down—as low down, if possible, as the level of the hip bones, giving the very fashionable woman the appearance of having square hips, as well as high shoulders. The contention, therefore, is that when the eye becomes accustomed to the large, or natural waist, the small waist looks exceedingly ugly, deformed and painful, and that the natural waist in woman, as in man, is the most beautiful

—that nature provides sufficient variety in the size, shape and form of all parts of the body to suit all healthy and natural tastes. The contention, further, is that women are no more admired, or dearly loved now, with small waist prevalent, than they were before the time of corsets, when the Venus de Milo was sculptured, or when the beautiful Helen caused the Trojan War. Nor is man to-day, with his natural waist, less attractive to woman than he has ever been. Professor Cope is quoted as saying, in defence of a small waist, that it is the natural tendency of a higher grade of evolution, in perfecting the human species. In this the professor is, to my mind, mistaken—a strange mistake, too, for one who claims to have studied nature from a scientific standpoint. If we go back a few removes from the human species, along the line of evolution, we find that a small waist characterizes more particularly animals that go on all fours. For instance, notice the greyhound and the spider monkey; but as man in the process of evolution began to assume the upright position, and to walk more and more erect, the pelvis became more developed, necessarily so. We notice this in the higher grade of monkeys. For instance, the chimpanzee has almost as well-formed thighs and pelvis as some of the lower African tribes of the human species. But the higher types of the human species walking magnificently and firmly erect have only attained that perfection by a corresponding development of the lower extremities. On observing, for instance, the Venus de Milo we find that the hips are not only broad, but taper very gradually towards the narrowest part of the body, which is situated almost level with the lower part of the breast bone. In other words, she is almost short-waisted. This is due to the splendid development of those muscles that attach the body to the hips and thighs, and maintain it easily and firmly in an erect position. The principle muscles, the quadratis lumborum, the recti-abdominal, and spinal-recti muscles, the tensor femoris, the adductor longis, the gluteous, and others. Nature thus provides the means to carry the body well poised, and to sustain it in the upright position, against forces that tend to disturb its equilibrium, and to enable the body to recover itself from the stooping position, or any other deviation from the erect, with ease and rapidity. What a miserable wickedness then to contract, diminish, and atrophy the waist close down to the hip bones, simply from an artistic standpoint. Compare the figure from a fashion magazine with the Venus de Milo, and the form of Powers' Greek Slave.

I have heard gentlemen, who were admirers of fine forms in women, remark that, however women may array themselves in clothing which has a tendency to misrepresent or distort her form, or display it, they always, even when observing these women passing on the street, endeavor to picture them in their minds in their real figures. Compare the fashionable dressmaker's form with Powers' Greek Slave. You will see that the fashionable body gives one the appearance of a humming top resting upon the point.

FIG. 1.



The evil effects of the publication in the fashion columns of the magazines of such illustrations as we have in Fig. 1, consists mainly, perhaps, in its educating the eyes of young women to a false model, inducing them to believe this is the ideal, their constant efforts to attain which results so disastrously to their health. The printing of such cuts, being so great an insult to the

intelligence and taste of humanity, as well as disastrous to health, should be prohibited.

THE COMMERCIAL VIEW OF STYLE IN WOMEN'S CLOTHING.

In these days, when small establishments are being done away with and business is becoming centralized in a few large establishments, it is easy to ascertain the methods employed by shrewd

FIG. 2.



business men to obtain phenomenal success by their ability to utilize the foibles of human nature and the remaining elements of barbarism in the human family, which prides itself upon admiration and attempts to merit respect by external ornamentation, where it does not value ornamentation or cultivation of the higher faculties

of the mind, the education of the brain and the natural beauties of a normal and healthy physique. The leading business establishments, especially those dealing in woman's dress materials, publish at great expense fashion magazines, which they push under your door and gladly furnish gratis. Art improves, but there seems to be no hope for the miserable creature who illustrates the fashion plates. His "figures" are the same sickly, compressed, painful, expressionless, flat, stilted sticks—unlike anything under heaven—with impossible waists, and feet that they saw in the first magazine fashion plate that his great-grandfather printed a hundred years ago. His rule is, neck and waist same size. I have measured many. They are also happy in controlling a fashion column in the leading newspapers, by which means they are enabled to enslave the weaker vessel. The sensible business man, clad in his comfortable business suit, sits in his office, and, looking out upon the street, smiles with exquisite satisfaction as he sees a lady struggling along, a traveling clothes-horse, whom he has succeeded in inducing to wear full skirts, over skirts, double skirts, long wraps or heavy wraps, and everything else that he can get on them. And they, unfortunate tools, perfectly unconscious of the use that is being made of them, only imagine that they are doing wonders. Indeed, if the shrewd dealer in dress material sees a plain, small skirt, or reads of there being an attempt to introduce them, he flies frantically to his newspaper squibs column, and prominently announces in every way that plain skirts are going out of fashion. Then, with still further business tact and enterprise, when all of the ladies have been furnished with short sacks, seal skin, or otherwise, that are possessed of the means to buy winter wraps, and the trade in that line is beginning to diminish, and prices are beginning to drop, he promptly brings out the long wraps, and the unfortunate ladies, not understanding all this, and seeing a few such wraps, or seeing the goods for the same and the announcement of such being the fashion, feel utterly miserable until they have obtained the new long wraps. Thus are they kept constantly changing from one thing to the other, never attaining satisfaction or contentment, constantly in a fret as to whether they have really got the correct thing. The shrewd business man further, finding that certain material or dress goods is not worn, buys out the entire lot upon the market, and in the following season, by his well-chosen methods, has it broadly announced that certain

material is to be the style. A rush is therefore made for this new material, shape or style until the demand is supplied, or until more of the material is manufactured or put upon the market by smaller dealers, when, by the same process, they change the tide. Thus poor human nature, especially woman's nature, is preyed upon, and they are enslaved and led in chains, from which they appear never to be able to see their way out. Through this degenerating influence of introducing unnatural, ungraceful and unhealthy clothing, merely to make a few men rich, most of the women in the higher walks of life are ruined in form, weakened in mind, deprived of the pleasures of life and its amusements, kept uncomfortable subjects of disease. No greater argument in favor of the greater intellectual power of man, as compared with that of woman, can be offered than the fact that man refuses to be changing materially the style of his dress, or to be led by all the whims of fashion. If man can succeed in keeping the opposite sex in splits that weaken the body, and encumber her with skirts that make locomotion difficult and prevent exercise, he can always keep her enslaved as the weaker vessel, can always keep her dependent, always keep her out of competition with himself in all the pursuits of life, thus riveting more firmly her chains. Indeed, man seems willing that woman should not be able to get on a street car, to walk up steps, or do anything else requiring physical effort, without his support. It remains for woman to rebel against such subtle methods of enslavement, to refuse to be the dupes of such methods, to be independent, to declare for themselves what they shall wear, thus securing their own health, strength and ability to compete in all the business walks of life. Women are naturally endowed with as much endurance as men, or even more. I do not contend that women, especially those who are weakened by fashion, do not now need help, but the contention is that she cultivate herself out of the necessity for this help to perform the slightest physical exertion.

THE RELATION OF THE WAIST TO DISEASES OF WOMEN.

The human body contains no useless space. The organs contained within the body are of the proper size, and cannot be increased or diminished in size without impairing their functions and causing their utter ruin. Nor can they be displaced without injury. These are facts admitted by anatomists, physiologists and physicians. If we take a woman's waist, say twelve inches

in diameter, and succeed, either rapidly by severe compression, or by beginning early in life and preventing the natural growth and development of the waist, in diminishing the diameter two inches, by any means, say, for instance, the use of corsets, we have necessarily diminished its contents or internal capacity seventy-two cubic inches. This is capable of absolute proof by geometrical or arithmetical demonstration. Now, since the organs cannot successfully be reduced in size, but are capable of being displaced to some extent, it follows that there is a displacement of the organs within the abdomen or seventy-two or more cubic inches. This amount of displacement is found to exist in all women who have worn corsets for a few years. This displacement takes place mostly in a downward direction, owing to the facility with which they can be compressed in that direction, aided also by gravitation as well as by lateral pressure. Lying immediately under the abdominal organs in the pelvis, and partly supporting them, hangs the uterus, suspended from the sides of the body within by elastic cords. This organ in a state of health is properly suspended at least half an inch above the floor of the pelvis, has free motion in all directions, and there is no organ in the body which exercises a greater influence upon the nervous condition of women, there is no organ with which the entire system sympathizes more quickly in disease, or one which, when diseased or disturbed in its functions, more quickly or thoroughly unbalances or deranges the whole system, supplied as it is with abundant nerve functions, as well as muscular and vascular possibilities. Just as surely as twice two make four is this organ displaced downward by the displacement downward of the abdominal organs which rest upon it. The result, therefore, of the displacement of the abdominal organs by diminishing the diameter or circumference of the waist, is displacement of the uterus. Down it goes promptly against the floor of the pelvis. Walking, sweeping, running a sewing machine, washing, almost every movement of the body, certainly all movements of the trunk upon the pelvis or lower extremities, cause a chafing, rubbing and abrasion on the tender surface or lining of this important organ, resulting necessarily and invariably in swelling, erosion, leucorrhea, tenderness, pain in the back, hips or loins, and also, in the majority of cases, the pressure from above being continued, a bending of the organ either backward or forward, thus adding a lateral to a downward displacement. This lateral displacement, in most cases, decidedly interferes with

the normal functions of the organ, preventing the proper escape of secretions from its interior. The ovaries and Fallopian tubes likewise necessarily share the same displacement, and being thus compressed their functions are interfered with, and add a large category of diseases to those which afflict the unfortunate uterus. It is therefore perfectly clear that no woman can be in a normal condition of health who has diminished even to a slight degree the diameter of her waist. Gynæcologists and specialists in the diseases of women are kept constantly busy, and they will tell you that a woman with healthy pelvic organs is a rare exception in these days. This is as unfortunate as it is unnecessary, and while woman is prevented from enjoying life and the advantages which spring from health, she and her husband are kept poor by the constant necessity for medical and surgical attention. Furthermore, the wearing of corsets causes an atrophy or dwindling away in all cases invariably of the muscles around the body upon which they press, just as splints upon any other part of the body causes a loss of function and atrophy, or diminishing of the size of the muscles.

It is a fact that if you take a healthy arm, even a strong arm, a blacksmith's, for instance, and place it in splints for a period of only six months, it will become so small, flabby, weak and useless that he can scarcely use it to lift a teaspoon to his mouth when the splint has been removed. Nor will the arm regain its normal strong and healthy condition until long months of use and freedom from splints have gradually again developed the muscles and restored them to their functional strength. This law holds good over all the muscles of the body. When, therefore, the muscles which surround the body and hold it up, and which enable a woman to walk, lift, stoop or stand erect with ease, have been weakened or atrophied by the wearing of corsets, the fact that they have been weakened, atrophied and partially paralyzed is proven by the fact that the woman will tell you that she feels as though she would fall apart. She cannot sit or stand with ease, is so weak that if she stoops over she is hardly able to recover her equilibrium or to pick up her weight from the floor. This explains also and answers a question which is now so often asked, namely, Why is it in childbirth women nowadays have to be so frequently assisted by the use of forceps or other obstetrical instruments? The reason is plain—the abdominal muscles, having been atrophied and weakened, and these being the muscles which assist and really

accomplish the work, are unable to fulfil their proper duty. Accordingly, during the time of pregnancy, as the uterus gradually expands, all that the woman had accomplished in the way of producing a small waist by a long use of corsets has to be entirely reversed. The ribs which have been contracted and compressed at the lower part of the chest are to be forced outward and expanded to something like a normal condition. The displaced organs have to be lifted to something like a normal condition. This places upon the womb an extraordinary burden. In addition to this, the womb, already compressed to some extent, has to overcome much more than the normal pressure in undergoing its regular enlargement to full term. Thus we have the fearful and continuous suffering, the nausea, the pains and the numerous miseries of which civilized women complain, and which are so conspicuously absent during gestation among the more uncivilized nations and among animals that have not been deformed by artificial means.

If you place a prop under a clothes line you must have some bottom for the prop to rest upon, otherwise it cannot hold up the line; so, if you hold up the bust by corsets or any similar prop, the corset or prop must rest upon the abdomen and its contained organs. So, if the corset holds up four pounds it presses down upon the abdominal organs four pounds. Not only are the muscles of the body atrophied, the woman prevented from bending the back or going through any graceful motion; not only are the abdominal organs depressed upon the contents of the pelvis, entailing perpetual disease; not only is motherhood rendered almost impossible and a hundred times more painful than necessary, but the wearer of corsets is prevented from physical exercise, gymnastics and other methods of developing the healthy strength of the body, and is prevented also from the higher and more refined accomplishments, such as vocal music, for the firm corset around the lower ribs prevents the action of the diaphragm, so much so that in all the best conservatories of vocal music it has been found necessary to make an imperative rule that lady students of vocal music shall not wear corsets, simply from a musical standpoint. The usual and ultimate effect, as has been above shown, of the wearing of corsets is to produce an inability to take physical exercise, to produce diseases which make the ordinary pursuits of life painful or impossible, and to bring about necessarily and invariably a tendency on the part of a woman to

sit a great deal, to avoid motion, walking or exercise of any kind. This in its turn, of course, brings about atrophy or diminishing of the muscles of the thighs, hips and legs, and, therefore, setting up retrograde evolution as it were. Thus the lower limbs becoming weakened, not being used as much as they should be, become more and more incapable of use. So fashionable women when fully dressed are scarcely able to walk two squares; indeed, many are tired and outdone before the elaborate process of "getting ready" to go out has been accomplished. This accounts in a satisfactory manner in many cases for the inexplicable disposition of women to remain in the house, thus depriving themselves of fresh air and exercise, so that a vicious circle of circumstances has been set up, by putting the waist in splints, far-reaching in its effects and disastrous in its influence upon the prospects and happiness of the sex. Diseases of the nervous system and of the chest, as well as many other diseases, are invited by the enfeebled and "run down" condition of the system, produced by the foregoing methods. In summer, corsets, being naturally thick and strong, keep those portions of the body over-heated. The corsets, however, usually go no higher than within ten inches of the top of the chest, thus leaving the most vital part of the lungs exposed in cool or cold weather to draughts and change of temperature, there being not more than a quarter the thickness of clothing and warmth over the top of the lungs and shoulders that there is around the lower part of the chest where it is not so much needed.

The *true* friend of woman should point out to her these things as he desires to see her reach still higher and grander achievements.

With all these facts staring a person in the face does it not seem strange that any logical, sensible person could persist in such a suicidal and unreasonable practice as that of trying to alter the shape and proportion of the human body by mechanical means of such destructive tendencies?

New York Milk Supply.

The inhabitants of New York consume, it is said, a great deal of beer and a reasonable amount of Croton water, but they do not neglect milk. Over 900,000 quarts are delivered daily, making an annual consumption of 329,500,000 quarts, or 82,325,000 gallons.

Some of the Causes of Indigestion and Malnutrition in Nursing Infants.¹

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It is the experience of all physicians that occasionally breast-milk, the natural food of babies, may cause serious disturbances of digestion. When a nursing child fails to thrive, suffers much from colic or constipation, loses in weight, vomits, or has dyspeptic stools, we may attribute these symptoms almost certainly to poor or scanty breast-milk.

The object of this paper is to show the very close association between the health of the mother and the composition of her milk. If the nutrition of the mother is depressed from any cause, the various food elements in her milk become so altered in proportion that they will infallibly cause indigestion in her child.

To make an analogy: If you order a fare of cabbage and pork for a woman of sedentary habits, she will be apt to complain most bitterly of dyspepsia, and, in many instances, breast-milk is as unsuitable for a baby as are cabbage and pork for a delicate lady.

Now, indigestion in nursing children is worthy of our serious consideration. The infant may present such serious disturbances of the digestive and nervous system that a change in diet may seem to be an urgent necessity. All of you will agree that giving a dyspeptic baby an artificial food is an exceedingly undesirable thing. The most scientifically prepared mixture of cow's milk, or of any dextrine food, is far inferior to human milk.

It is my opinion that in a considerable number of cases weaning may be avoided, or be postponed by improving the mother's health, and thereby transforming the unnatural secretion of her breasts into normal milk. Here it is necessary to speak briefly of the physiology of lactation: Human milk contains virtually the same food elements as the dietary of an adult.

¹ From The Trained Nurse.

There is a large proportion of water—88 per cent.—about 4 per cent. of fats, easily assimilated, potential in the formation of heat, the undigested residue acting as a natural laxative. We find from 1 to 2 per cent. of complex albuminoids, 6 to 7 per cent. of a carbohydrate sugar of milk, and a minute quantity of mineral salts.

Of the food elements of human milk, the albuminoids are the most variable, the fats are next, and the lactose least of all. The more nearly the mother approaches an ideal standard of health, the more closely will the albuminoids approach 2 per cent. and the fats 4 per cent. of the total bulk. Both are elaborated by the metabolism of protoplasm in the cells of the mammary gland, all of the food elements, fats, albuminoids and sugar are chiefly formed from proteid food. A civilized woman should live principally upon a fare of meat, poultry and vegetable proteids to secure a normal milk. If she be given large quantities of fatty food to remedy any deficiency of cream in her milk she will probably develop an indigestion, and the fats in her milk will notably diminish.

In amount the quantity of milk varies from one to three pints daily, increasing with the age and necessities of the child. A great advantage of lactation is that a baby suckled by its mother is seldom overfed. The position which the infant takes in nursing, and the slight effort and subsequent fatigue required to empty the collapsing gland, tend to prevent overfilling the stomach.

Yet this marvelous adjustment of human milk to the baby's needs is often disturbed. The composition of the milk is an index of the health of the mother. If she be ill, exhausted, or anæmic, a marked change takes place in the milk. The percentage of albuminoids becomes larger and the fats are diminished.

Now, in the infantile economy, the fats appear to be most essential and most easily assimilated, the proteids are less necessary, and when present in any excess are digested with difficulty, causing pain, vomiting and diarrhœa.

Frequent nursing may also cause a change in the solid constituents of milk. The fats and albuminoids may be thus increased from 25 to 50 per cent. above their normal limits. Among the higher classes, the anæmia, which haunts the Anglo-American woman, undoubtedly has an important effect in producing poor milk. As milk is elaborated from the blood, how

can a normal secretion be made from poorly oxygenated blood? Lastly, in civilized woman the duration of lactation is often considerably shortened; a certain number of mothers have little or no milk after the fifth or sixth month. All of these facts explain much of the dyspepsias and malnutrition of sucklings.

As practical physicians, we judge of the good or bad qualities of breast-milk by the baby's appearance and behavior. The child should be plump and good-humored, should gain continually in weight, and should have from one to three semi-fluid stools a day, containing no undigested casein. To form a correct idea of an infant's health it should be weighed once a week, the stools should be examined for undigested milk, and the cause of attacks of colic and restless nights should be carefully investigated.

In speaking directly of indigestion and malnutrition in nursing babies, it is convenient to first discuss:

(1) Those cases in which the supply of breast-milk is merely inadequate for the infant's needs.

(2) Those in which there is abundant milk, but where the child is irritable, dyspeptic and losing weight, showing that the milk is unsuitable for its digestion.

Breast-milk is often secreted in very small amounts in the first weeks of lactation. In a certain number of cases, relatively small, I believe this condition may be due to imperfect development of the mammary glandular apparatus, but in a large number of cases a scanty supply of milk is caused by improper hygiene, unwholesome diet, lack of out-door exercise, overwork, late hours, worry, insomnia, anæmia, constipation, or too lengthened intervals of nursing.

The early failure of the milk may be due to an inadequate diet directly after confinement, or there may be septic processes in the pelvis, the result of injuries to the parturient canal. The baby should be given the breast at proper intervals for at least two weeks, for the secretion of milk may be delayed. Two little persistence is usually shown. The attendants are entirely too ready to resort to artificial feeding.

Sore nipples are not always a valid reason for weaning. It may, however, happen in the first few weeks or months of lactation that, although the baby is regularly nursed, it is not well, and the mother may be led to believe that her milk is too scanty, or that it is unfit for the child's digestion.

The signs of an inadequate milk-supply are :

(1) The child will nurse for a long time, perhaps a half-hour, before it is satisfied ; generally the breasts are emptied in ten to fifteen minutes.

(2) The child will cry, as if hungry ; after nursing, is apt to be peevish and restless.

(3) A poorly nourished baby is often plagued with wind-colic, the result of insufficient food. It is commonly constipated, having a small hard stool every two or three days.

(4) The baby is weak, cold, languid, has flabby muscles. It has a stationary or diminishing weight.

Now, this phase of infantile atrophy is of frequent occurrence in the easy classes of society, and is a very serious thing if it take place in summer. When a physician finds the milk-supply failing, and the baby, in consequence, deteriorating in health, he should carefully question the mother as to how she eats and sleeps, whether constipation is present, as to the amount of household work she does, and whether she takes a daily walk. Very many times the breast-milk may be increased up to the needs of the child by requiring the mother to go out daily into the open air, and by the avoidance of exhausting domestic duties.

Below will be found a series of exceptional cases selected from a large number of analyses, illustrating peculiarities of infantile digestion. Infants all digesting well and gaining in weight.

HUMAN BREAST-MILK ANALYSIS.—ROTCH.

	1	2	3	4	5	6	7	8
Fat	4.37	3.76	3.16	3.82	2.96	2.09	2.02	2.36
Sugar	6.30	6.95	7.20	5.70	5.78	6.70	6.55	7.10
Albuminoids	3.27	2.04	1.65	1.08	1.91	1.38	2.12	2.20
Ash	0.16	0.14	0.21	0.20	0.12	0.15	0.15	0.16
Water	85.90	87.11	87.78	89.20	89.23	89.68	89.16	88.18

These tables are most interesting, for they not only explain the cause of infantile indigestion, but demonstrate that an improvement may often be obtained after the adoption of a proper

regimen. As a matter of fact, the treatment of these is principally hygienic; the troubles caused by menstruation or a cracked nipple soon pass away. The woman should lead a placid, comfortable life. She should be relieved from excessive household work. To transform poor milk into good, to decrease the undigestible albuminoids, and to increase the fats, no means is better than daily walks (below the point of fatigue) in the open air. The tonic effect of out-of-door exercise is more efficient than any medication at our command. A very important problem is the feeding of the baby while the milk varies from the normal standard. I will say that when you have secured a proper hygiene for the mother a rapid improvement usually takes place. If the baby is not actually ill, it may certainly take some of the breast-milk. It will usually digest the milk, or may be allowed to nurse four or five minutes, then be given a few teaspoonfuls of sterilized water, then be allowed to satisfy itself at the breast. The breast-milk is thus diluted in the baby's stomach.

I am well aware that this paper does not discuss all of the causes of indigestion in nurslings, nor does it relate a series of brilliant cures. Any assertion that poor milk can be changed into good milk would be strongly charged with falsehood. In conclusion, I would say that dyspepsia in sucklings receives too little thought and attention from the profession. Illness in a nursing woman means poor milk and a sickly baby. The foundations of constitutional weakness and life-long dyspepsia may in this way be laid. Very often skillful treatment of the mother will relieve both mother and child. Surely, no epoch in a woman's life is more important than that when her own well-being is associated with that of her child.

Typhoid Fever From Ice Cream.¹



RECENT outbreak of typhoid fever in London was traced to the distribution of infected ice cream by Italians living in Middle Lane. It is quite possible that this may be a frequent source of typhoid fever in New York, Chicago and other large cities in this country, as well as in London. Ice cream is extensively hawked

¹ From Good Health.

about in all our large cities by Italian and Syrian vendors, whose ignorance and irresponsibility might easily lead to the use of contaminated water or milk from infected sources. The readiness with which typhoid fever germs develop in milk and the ease with which milk may become infected from the containing vessels, or the use of infected water as a diluent, renders this one of the most common and prolific sources of typhoid fever infection.

At this season of the year the intimate relation between milk and typhoid fever is a question which ought to be generally agitated. The month of December annually brings with it a great crop of typhoid fever cases, and a mortality, under ordinary treatment, of little less than 20 per cent. That milk is the most ordinary source of infection is a question too well settled to be longer disputed. The disease is not infrequently propagated through water, and in exceptional cases through the air, but the most common source of infection is undoubtedly 'through the water supply. Whether or not disease germs are capable of passing alive through the intestines of the cow, and thus gaining access to the milk through the carelessness and uncleanly habits of dairymen, is a question which has not been authoritatively settled, but this may be regarded as a possible source of infection.

The recent discovery made by French investigators of the close relation between the typhoid fever germ and the bacillus coli, a germ always found present in the colon and in human excreta, suggests that it is not always necessary to find a direct relation between a previous case of typhoid fever and a new outbreak, as the disease may possibly originate without a previous case of typhoid fever through the infection of the milk or water supply with the bacillus coli from human excreta.

It is manifestly necessary that every possible precaution should be taken to avoid the use of contaminated milk or water. It is also important that when the water supply or milk supply is not known to be absolutely pure, both should be rendered incapable of mischief, even though they may contain disease germs, by exposure to a boiling temperature. Either milk or water boiled ten or fifteen minutes will be rendered thereby entirely incapable of communicating typhoid fever or any other infectious disease. All germs will not be killed by exposure to the temperature named for so short a time as fifteen minutes, but all germs capable of producing acute disease will be killed even by this short exposure to a high temperature. In fact, it is well

known that the great majority of germs, including the typhoid fever germ, are killed at a temperature considerably below that of boiling water.

Our advice to the reader is, if you do not know that your milk and water supplies are absolutely pure, take neither without boiling. In visiting a large city like Chicago, or any other city in which the enormous quantities of milk furnished do not permit of a close inspection of all the sources of supply, it is unwise to make use of milk without first boiling it. The writer has in mind a case in which an outbreak of typhoid fever occurred in a small city hotel in consequence of a neglect of this precaution. Three of the inmates suffered very severely from the disease, and several others suffered from light attacks.

Healthy Homes.¹

BY HELEN L. MANNING.

SLOPS AND GARBAGE.



THE office of the sanitarian is to point out defects in the management and arrangement of house and premises and to suggest wholesome improvements. Therefore, although not the most pleasant of subjects for discussion, this series would be incomplete without a chapter devoted to the best methods to employ, under varying conditions, for the proper disposition of refuse organic matter. It is stated that fully one-half of the premature deaths are due to preventable causes, and the careless disposal of this refuse may be reckoned as a most potent factor in breeding disease in homes and communities. Any arrangement or system which allows the accumulation of foul matter in or around the home invites disease and death. Decomposition goes on rapidly and generates foul gases which contaminate the air, while the semi-solids are often left to contaminate the soil and eventually the water supply. Leaky soil-pipes, from either defective plumbing, rust, or other damage, not infrequently fill an entire house with noxious gases. Sometimes

¹ From Good Health.

the defect will cause a tiny cesspool to form in basement or cellar, or sometimes the defect will be such as to cause a foul-smelling ooze along a partition wall. The ventilating shaft to water-closets is often too short, so that the gases and odors return into the living rooms, or they may be so imperfectly constructed as to contaminate all the rooms adjoining.

Again, closets and bath-rooms are sometimes constructed in houses where there are no regularly arranged water pipes and no system for flushing. The writer has visited houses where such imperfect fixtures made the air of bed-rooms adjoining fairly sickening, and where the families were constant patrons of the doctor.

The prevention and restriction of typhoid fever depends more largely upon the proper disposal of excreta than upon any other one thing. The disease is propagated by an infectious germ found chiefly in the discharges from the body, and which will multiply and grow rapidly unless sterilized. If thrown out carelessly or put into an ordinary privy vault, or worse yet, into the horrible depths of a "privy well," the organic poison may contaminate the wells of a whole neighborhood or town, thus carrying disease and death to the inhabitants. Typhoid fever is a filth disease, just the same as cholera, and both can be prevented by rigid cleanliness and attention to sanitary laws. Diphtheria and scarlet fever are two more diseases often due to imperfectly constructed traps, foul closets, or defective drains. Can we, then, permit these things to be, and yet hold ourselves guiltless? With the flood of sanitary light in this generation, is there any adequate excuse for ignorance?

In buying, renting, or building houses in localities where there is a regular system of drainage and water supply, it is always advisable to see that the most modern and perfect appliances for closets and basins are included, in order to provide against sewer gas and other deadly gases. There are defects and objections to nearly every form of closet-pan and valve, and only constant vigilance and the free use of disinfectants in conjunction with adequate flushing, will suffice to keep them in a wholesome condition.

Drawn lead makes the best soil pipe. The pipe should be large enough to carry away all the refuse easily and its joints perfect. Neither zinc nor tile should be chosen. Iron is used considerably and answers fairly well, though it rusts easily and

any roughening of the surface is apt to cause lodgments and prevent perfect flushing. If possible all soil pipes should run on the outside of dwelling houses, thus being more readily open to inspection and safer for the inmates. Ventilation of the pipes should be provided, of course, and moreover the closet itself should be placed where it can be well ventilated—never in the centre of the house.

For those who live in the country and smaller towns, the proper disposal of excreta is a more simple matter, although it may be questioned whether in the majority of cases the system used is not as pernicious as that prevailing in larger cities. That this is true is due both to carelessness and lack of knowledge of more perfect means. The outhouses adjoining many country and village homes are veritable pest houses, and are undoubtedly the cause of a great amount of ill health and premature death usually classed as "mysterious." No disinfectant or deodorizer is used, the stench of decay is sickening in the extreme, and the poison is communicated to the air, the soil, and often to the water supply.

The ordinary vault should be dispensed with and some sanitary substitute provided. If you wish to avoid personal trouble in the matter, excellent ready-made earth-closets of various sizes can be procured, both of American and English patterns. Sanitarians and members of public boards of health give these articles, when properly used, their unqualified approval. But as their merit lies in the use of sifted earth or coal ashes in sufficient quantity, a home-made substitute can be provided at small cost of labor or money. Sand and gravel are perfectly valueless as deodorizers and disinfectants, nor will wood ashes answer. But garden earth, road dust and coal ashes possess peculiar properties as absorbents and disinfectants. Where any of these things are used in sufficient quantities, very little smell is ever noticeable.

If an earth closet is decided upon, it can be placed in the rear of the wood-house, properly screened, of course, or a privy may be constructed for it, or an old one completely renovated and fitted up. Either one of two ways may be selected for improvising an earth-closet. The simplest and generally to be preferred plan is to make a water-tight box (wood, lined with several coatings of coal tar) and place it in position to receive the excreta. Put handles on the back of the box to facilitate its withdrawal when necessary to empty it, which will be about once in two or four weeks, depending on the circumstances. If the ground in

the rear of the outhouse is lower than at the front entrance, a box quite deep may be used. When emptied, the contents should be at once mixed with a considerable quantity of earth, and spread over the surface, so as to be quickly deprived of its noxious properties by the action of the air and the sun.

Another very good plan is to have a vault below the sliding drawer with sides lined with mason work laid in water lime, and into this the contents may be periodically dumped through a false bottom in the drawer. This vault may then be cleared out once in three or six months, a job said to be no more disagreeable than that of shoveling sand. The interior arrangements of the privy may be in ordinary style, with the addition of a box or barrel of nicely sifted earth or coal ashes, fitted with a large tin scoop by means of which each visitor is expected to throw down about a pint and a half as a deodorizer and disinfectant after using. This will not consume more than a half minute of time, and will secure sanitary conditions of inestimable value. Under no circumstances should chamber or other house slops be poured into a regularly manufactured earth-closet or into one improvised as described above.

Air and Light—A Doctor's Story.

THE following verses, which appeared in the *Sanitarian*, an of New York, express in a clear and racy manner one of the greatest difficulties with which medical practitioners have to contend, the fondness of their patients for swallowing physic, while carelessly or ignorantly neglecting the simplest rules of hygiene :

I.

Good folks ever will have their way.
 Good folks ever for it must pay.
 But we, who are here and everywhere,
 The burden of their faults must bear.
 We must shoulder others' shame,
 Fight their follies and take their blame ;
 Purge the body and humor the mind,
 Doctor the eyes when the soul is blind ;
 Build the column of health erect
 On the quicksands of neglect ;
 Always shouldering others' shame,
 Bearing their faults and taking the blame.

II.

Deacon Rogers, he came to me ;
 " Wife is a-going to die," said he ;
 " Doctors great and doctors small
 Haven't improved her any at all.
 Physic and blister, powders and pills,
 And nothing sure but the doctors' bills !
 Twenty old women, with remedies new,
 Bother my wife the whole day through ;
 Sweet as honey, or bitter as gall—
 Poor old woman, she takes 'em all ;
 Sour or sweet, whate'er they choose,
 Poor old woman, she daren't refuse.
 So she pleases whoever may call,
 And death is suited the best of all.
 Physic and blister, powder and pill,
 Bound to conquer, and sure to kill !"

III.

Mrs. Rogers lay in her bed,
 Bandaged and blistered from foot to head ;
 Bandaged and blistered from head to toe.
 Mrs. Rogers was very low.
 Bottle and saucer, spoon and cup,
 On the table stood bravely up ;
 Physic of high and low degree,
 Calomel, catnip, boneset tea—
 Everything a body could bear,
 Excepting light and water and air.

IV.

I opened the blinds ; the day was bright,
 And God gave Mrs. Rogers some light.
 I opened the window ; the day was fair,
 And God gave Mrs. Rogers some air.
 Bottles and blisters, powders and pills,
 Catnip, boneset, syrup and squills,—
 Drugs and medicines, high and low,
 I threw them as far as I could throw.
 " What are you doing?" my patient cried ;
 " Frightening death," I coolly replied.
 " You are crazy," a visitor said ;
 I flung a bottle at her head.

V.

Deacon Rogers, he came to me,
"Wife is a-comin' around," said he.
"I really think she'll worry through,
She scolds me just as she used to do.
All the people have poohed and slurred,
All the neighbors have had their word;
'Twas better to perish, some of 'em say,
Than to be cured in such an irregular way,"
"Your wife," said I, "had God's good care,
And his remedies—light and air.
All of the doctors, beyond a doubt,
Couldn't have cured Mrs. Rogers without."

VI.

The Deacon smiled and bowed his head;
"Then your bill is nothing," he said.
"God's be the glory, as you say!
God bless you, doctor! good day, good day!"

VII.

If ever I doctor that woman again,
I'll give her medicines made by men!
—*W. M. Carleton.*

The Heathen and Corset-wearing.

Mrs. Annie Jenness Miller relates the following: "A missionary returned from Turkey once told me that a Turkish woman told her that she 'never knew what it was to be sick until she became a Christian and wore corsets.'"

Ivy Poisoning.

A simple remedy for ivy poisoning, and one which affords instant relief, is water applied as hot as can be borne. Ivy poisoning is often a very serious matter. In cases of severe poisoning the eruption often recurs every summer, and causes great discomfort and pain. The hot water should be applied every hour or two, or as often as the itching returns. Poisoning by sumac yields to the same treatment.

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An Instructive Epidemic of Small-pox.

THE city of Reading, in this State, is now passing through an epidemic of small-pox, connected with which there are several interesting and instructive points. In the first place the low rate of mortality that has characterized this epidemic thus far is remarkable, for although there have been some 450 cases of this disease, there have been but fourteen deaths; while this fact is very satisfactory for the victims of the disease, it is very unfortunate in its influence upon the course of the epidemic, for since there are so few deaths the people of Reading are loth to believe that the disease is really small-pox, as they are accustomed to associate great mortality with this loathsome disease, hence are they but lukewarm in their co-operation with the efforts that are being made by their very efficient Board of Health to battle with the epidemic. This is a fatal error, and the sooner the people of Reading awake to a realization of this fact the better will it be for them. We can assure our good friends of the capital city of Berks County that the most loathsome of all diseases is frightfully prevalent in their midst, and while we would not have them panic-stricken, we would yet earnestly and fervently beg of them to properly appreciate the situation and to earnestly co-operate with their Board of Health.

The two prime, indispensable factors in the control of an epidemic of small-pox are *vaccination* and *isolation*. Until recently these two effective measures were not universally resorted to in Reading because of the apathy, indifference and even

hostility to these measures of many of the people. Thanks to the efforts of the Reverend Rathers Borneman and Cleary the evil results of a tirade against vaccination in a local paper have been to a great extent averted, but even yet the people require considerable missionary work in this direction. This question of opposition to vaccination is something that we have never been able to understand; the reputable medical profession of the world, the opinion of all qualified sanitarians is a unit as to the preventive efficacy of vaccination, yet the tirades of a few ignorant, incompetent and prejudiced persons will so influence large numbers of persons as to cause them to disbelieve in this divinely beneficent discovery.

We have conceived a great respect for the good people of Reading, but we must warn them that they are living in the midst of a daily growing danger that will likely assume alarming proportions with the advent of winter unless they unitedly work like beavers to eradicate it. The local Board of Health has now decided to enforce *universal* vaccination and isolation, and in this determination they are supported by the unanimous opinion of the State Board of Health.

We earnestly ask the people of Reading to offer no obstacle to this work of their board, to aid it in every way, to strengthen their hands by liberal appropriations and to co-operate with them in every possible way. If they do, the present epidemic will soon pass into history; if they do not, God alone knows when and where this terrible state of affairs will stop.

A Dangerous House.

A family of nine in Paris occupied a house inhabited ten years previously by two tuberculous patients. A short time after, although the whole family had always been in splendid health, three among them showed symptoms of tuberculosis. They used the same bedroom as the former tenants. Dr. Ducor had pieces of the wall-paper examined, and dust from the ceiling and walls was also examined. In both cases the tubercle bacillus was found. The former occupants had been uncleanly in their habits; the sputa dried on the walls, and the bacillus, as M. Vignal has shown, retained its vitality, and was not destroyed by disinfection.

—*Medical Review.*



A New Dietetic Regimen.

M. Germaine See has recently called attention to the fact that modern investigations have considerably changed the views of physiologists respecting the proportion of nitrogenous and carbonaceous food elements required for the sustenance of the body. The old theory required 4 ounces of albumen, 1 1-3 ounces of fat and 12 to 15 ounces of carbo-hydrates, or sugar and starch, making in all 17 to 30 ounces of water-free food. According to M. See, these figures are to-day completely changed, as the result of observation upon different races and physiological experiments; the amount of albumen required has been reduced one-half. The proportion now recognized as necessary for the maintenance of health is: Albumen, 2 to 2 1-3 ounces; fat, 2 ounces; starch and sugar, 16 1-2 ounces; or about 21 ounces of water-free food elements.—*Bacteriological World*.

Transmission of Scarlatina by Books.

Semaine Med. relates that an English physician has informed the authorities of a well-authenticated case of transmission of scarlatina through a book taken from a circulating library. He points out that the circulation of such books may be an easy means of spreading contagious matters, because infectious particles are very liable to stick to books and because convalescents are very fond of reading. For this reason the English authorities have decided that persons affected with contagious diseases, who take books from a circulating library, thereby facilitating the dissemination of infection, are guilty of a misdemeanor and amenable to law. Being amenable to law may prevent some persons from contaminating books, but a higher moral sense would be better. What is needed to-day is a higher development of the moral faculties and a higher degree of moral health in matters like these, so that one would no more allow a book used by a scarlet fever patient being put back into a library for others to use than he would steal a purse of gold from a stranger's pocket.—*The Journal of Hygiene*.

A Chemical Substitute for Sugar.

A Berlin chemist has discovered a chemical substance called valzin, which is 200 times sweeter than sugar, and is said to possess none of the unpleasant properties of saccharine. It is not likely, however, that this substance will ever take the place of sugar, as it is a purely chemical substance, possessed of no food value, and if taken in any considerable quantity would doubtless prove to be exceedingly unwholesome.

Obesity and Life Insurance.

M. Kirsh has examined the condition of obesity from a life insurance point of view, and has reached the following conclusions:

(1) Medium obesity does not, in general, give a reason for refusal to give an ordinary policy of insurance.

(2) If obesity is hereditary; if, in the antecedents of the family of the candidate, there has existed saccharine diabetes or cerebral hæmorrhage, the examiner should be very circumspect.

(3) If the obesity is very great, more prudence is necessary, and the heart and the urine should be examined with extreme care, as a very obese man is like a colossus upon feet of clay. Irregularity of the pulse or pronounced slow heart are always very bad prognostics.

(4) When great obesity coincides with chronic alcoholism, the chances of life are very much reduced.—*Wiener med. Presse*.

Fashionable Sweepers.

A prominent physician, who gives close attention to bacteriological study, says: "Lately the long dress trains worn in the streets by our ladies, suggest another way to carry tubercle and other bacilli in our houses. In walking along our streets, we constantly see dresses wipe up portions of sputum from the pavements. From one of these dresses, dragged over the streets a few times, I was able to demonstrate the presence of seven tubercle bacilli on an inch microscopic slide on which a little dirt off a dress was dusted. Knowing, therefore, that these long dresses have dried tuberculous sputum on them for the maids to dust off in our ladies' dressing-rooms, most of which are poorly ventilated, we can quite understand how a sufficient number of bacilli can be collected in small compartments, to an extent dangerous to at least those predisposed to tuberculosis."—*Boston Journal of Health*.

Artificial Ice.

The Massachusetts State Board of Health has been conducting an examination of artificial ice manufactured around Boston, and found that it was of good quality and wholesome, although the samples made by one company from boiled, but not distilled, spring water contained a large amount of mineral matter. The following are the conclusions of the Board: (1) Artificial processes of freezing concentrate the impurities of the water in the inner core, or the portion last frozen; (2) the impurities are reduced to their lowest terms by the use of distilled water (condensed steam) for the manufacture of ice; (3) the number of bacteria in artificial ice is insignificant under the prevailing methods of manufacture; (4) the amount of zinc found in the samples of melted artificial ice under observation is insufficient to injure the health of persons using such ice.

Drunken Oysters.

"I do believe," said an oyster grower to a reporter, "that whisky will make anything drunk. The latest experience I have had in that line was with an oyster bed that I have down in the bay. I have seen cats spoiled in their growth by whisky, and dogs kept small. I have seen talkative poll parrots bowled up until they fell off their perch, and lay squeaking and ha-ha-ing at the bottom of the cage in the most delirious manner, but I never saw an oyster bowl up except in restaurants, and even then the oyster didn't know it. I resolved to see what effect whisky would have on a small bed that I had for my own personal use. I got some malt whisky one morning, and went down to the bed. I let in fresh water, and then poured in a little whisky. Next day I did the same thing, only I used more whisky. The whisky told on those oysters in a minute; it was too much for their nervous system. Whenever you touch an oyster's shell, it closes up mighty quick and tight. I saw one lolling partly open, and put my finger down to touch it. It feebly closed up and then opened again. I tried it several times, with the same effect. The oyster was not dead, it was simply too drunk to know there was anything dangerous in this world. This condition of things lasted several hours, when the oysters would regain their wisdom and close up tight at the slightest disturbance of the water."—*Weekly Sun*.

American Climates and Resorts.

Dr. Duncan has ably voiced the best sentiment of the medical profession in making a plea for a national sanitarium for consumptives. What has been a great blessing in England can with our superior climatic advantages accomplish untold good here.

It is absurd to claim that if a national sanitarium for consumptives were provided by Congress, the way would be immediately paved for the creation of all sorts of useless projects. One of our abandoned military posts is just what is needed and ought to be available.—*New York Medical Times*.

The Rind of Fruit Indigestible.

That the rind or skin of all fruit is more or less indigestible is a fact that should not be forgotten. We say all fruit, and the statement must be understood to include the pellicle of kernels and nuts of all kinds. The edible part of fruit is peculiarly delicate and liable to rapid decomposition if exposed to the atmosphere; it is, therefore, a wise provision of nature to place a strong and impervious coating over it as a protection against accident and to prevent insect enemies from the seed within. The skin of plums is wonderfully strong compared with its thickness, and resists the action of water and many solvents in a remarkable manner. If not thoroughly masticated before taken into the stomach, this skin is rarely, if ever, dissolved by the gastric juice. In some cases pieces of it adhere to the coats of the stomach as wet paper clings to bodies, causing more or less disturbance or inconvenience. Raisins and dried currants are particularly troublesome in this way, and if not chopped up before cooking, should be thoroughly chewed before swallowing. If a dried currant passes into the stomach whole, it is never digested at all. In the feeding of domestic animals this fact should be kept in mind. If grain and leguminous seeds are not crushed or ground, much of the food is often swallowed whole, and the husk or pellicle resists the solvents of the stomach, causing a considerable loss of nutriment. Birds, being destitute of teeth, are provided with a special apparatus for grinding their seed, namely, the gizzard. The indigestibility of certain nuts is partially due to the brown skins. Blanched almonds, on this account, are more digestible than those which have not been so treated.

Deserved Honor.

We are glad to note that our esteemed friend, Dr. Pietra Santa, of Paris, has recently been honored by the King of Italy, who has presented him with the insignia of the Order of the Crown of Italy. Dr. Pietra Santa was physician to the last Napoleon, and has been for many years Secretary of the Society of Hygiene of France, and has been one of the most active and enthusiastic workers in behalf of sanitary reform and progress in Europe. We hoped to have the pleasure of seeing this distinguished scientist, physician and sanitarian at the World's Columbian Exposition, but fear that although still active in his professional and literary labors, his advanced age will not permit him to undertake the hardships of an ocean voyage.—*Ex.*

Tea-Drinking in Ireland.

Francis Hope, writing in *Good Health*, says that the city of Belfast is noted for its tea-drinking capacities. The returns for 1892 show that during the last year they have consumed no less than five million pounds, to the value of \$2,500,000. This gives an allowance of twenty pounds to each man, woman and child in the city. Estimating it at the low average of 2s. per pound (for even the poorest insist on having *good* tea, and many the best at 4s.), we have £2 spent by each individual for tea. In most poor families there are six souls (sometimes twenty-four), so that these poor families spend £12 a year on this worse than useless article. Add to this the amount spent on tobacco and drink, and on the total amount the city could actually be supported and well fed, and starvation a thing of the past.

As one passes through the squalid streets where the poor live, and views the abject poverty, the real suffering from want, the dirt and degradation, the sight is overwhelming. One's heart is wrung for the misery of these poor souls. Yet the remedy is in their own hands, and how different it might all be if they only "knew how," and would practice a little self-denial, instead of looking for help to such a broken reed as Parliament and listening to the frothings of the paid agitator! Poor souls! they perish for lack of knowledge. Is there not some one who will teach these people how to live, and show them a more excellent way?

Malaria in Water.

The *Sanitary Era* says: "We have quoted from year to year many instances transpiring of severe intermittent fever as the result of drinking, or even bathing in, vegetation-contaminated waters, such as most physicians have been in the habit of indorsing as perfectly harmless. Of the terrible African fever, Surgeon Parke, the companion of Stanley, writes (*Lancet*, May 28): 'Perhaps the sharpest attack experienced during this part of the journey was my own, which followed a ducking received in crossing a tributary of the Congo. My donkey slipped accidentally and completely submerged me. This was but the first of a long series of experiences in which I found that every wetting in Equatorial Africa meant a subsequent attack of intermittent fever. Another lesson soon learnt, and for which I was still less prepared, was the fact that our donkeys after each corresponding drenching developed febrile symptoms exactly corresponding to those of their fellow travelers.' "

Ozone as a Disinfectant.

The fact that electricity enables ozone to be generated cheaply and on a large scale may have a most important bearing in the future as a sanitary measure, more particularly, however, in relation to cholera epidemic. That some connection exists between the spread of cholera and the scarcity of ozone in the atmosphere there appears to be little doubt from observations begun as early as 1884 and continued ever since. There is a normal amount of ozone in the atmosphere, and it appears from these observations that at places where the cholera existed the amount of ozone in the atmosphere was below this normal, sometimes even to a very marked degree. When made by chemical processes ozone may be injurious from the presence of impurities. If, however, the air be ozonized by means of electricity, it has been found to be quite non-injurious. P. de Puyt recently made some very interesting and instructive compilations regarding this matter, and urges very strongly the use of ozonized air, not only as a destroyer of germs in hospitals, lazarettos, schools, public houses and other places, but also as a preventive in the case of a threatened epidemic. Eleven or twelve centigrammes per litre of air, which is easily produced by electrical means, and was formerly claimed to be a dangerously large quantity, he says has been found to be perfectly harmless, even for infants, if made by electrical means.

Buttermilk in Rational Dietetics.

Merck's Bulletin has recently printed a series of papers upon the subject of the "Physical Derivatives of Milk," the last of which, on buttermilk, is worthy more than a passing notice. The result of the investigations goes to prove that by using a buttermilk diet the maximum amount of constructive and reparative work can be accomplished within the animal organism at a saving of one-third of the oxygenating capacity of the system. In this large amount of reparative work upon a small outlay of oxygen the great value of the buttermilk diet finds its true explanation. This quality of buttermilk makes it a most valuable food in all conditions of diminished oxygenating capacity and states of sub-oxidation, and it should be used freely wherever there is a mechanical defect in the pulmonary organs, such as pleurisy with compression of the lung by accumulations of fluid, emphysema, tuberculosis, etc. This excellent article of diet was extensively used by the physicians of the older school, but has been very much neglected in later years.

Music and Disease.

Dr. Blackman, a medical practitioner of considerable note, contributes to the *Medical Magazine* an interesting and rather curious article on the subject of music as a medicine. His theory is that the effect of music is impressed by a reflex action on the nerves which govern the supply of blood. The effect of music is to dilate the blood-vessels so that the blood flows more freely and increases the warmth of the body. By this increased blood-supply nutrition is affected. As the improvement of the health depends upon nutrition, the musician may be of great assistance to the work of the physician. Says Dr. Blackman :

"The physiological effects of music have been studied by Dogiel, a Russian, and as the result of numerous experiments he concludes that: (1) Music exhibits an influence on the circulation of the blood; (2) the blood pressure sometimes rises, sometimes falls; (3) the action of musical tones and pipes on animals and men expresses itself for the most part by increased frequency of the beats of the heart; (4) the variations in the circulation consequent upon musical sounds coincide with changes in the breathing, though they may also be observed quite independently of it;

(5, 6, 7) the variations in the blood pressure are dependent on the pitch and loudness of the sound and on the tone color; (8) in the variations of the blood pressure, the peculiarities of the individuals, whether men or lower animals, are plainly apparent; and even nationality in the case of man has some effect.”

The idea of the employment of music in disease is, however, by no means new. More than thirty years ago it was tried with satisfactory results in asylums for the insane. Yet in some instances music has not only inspired but even increased madness, seldom forms of violent aberration. The case of the unhappy King of Bavaria, who went mad over Wagner's music, will be recalled. The concord of the sweet and sonorous sounds of that composer, forever haunting the chambers of his brain, had disordered it.—*Baltimore Catholic Mirror*.

Contagion.

When a person receives the contagion of any disease, from another sick with it, it is not always necessary that the recipient should have touched the sick person. Scarlet fever and diphtheria are often communicated to others who do not approach the sick, but are only in the same room. In such cases the medium of communication is the atmosphere about the patient, which is charged with the contagion. In this way the visiting party gets the disease from “a previous case.”

But that is not the only way in which it can be given. The “previous case” may be a fatal one, may die and be buried. Now if the clothing of that patient be packed in a trunk and be shut up from light and air, and if it be subsequently opened weeks, months, or even years afterwards, and if the clothing be taken out of the trunk and shaken in the presence of a susceptible person, he will take the disease, although the “previous case” may have been dead and buried before the one who gets the contagion from his clothing was born. Here the medium of contagion between the “previous case” and the present one was the infected clothing. It illustrates the prime importance of complete disinfection of everything which may have been infected by such patient. It illustrates also the remarkable vitality of these disease germs.

Under favorable conditions disease-producing germs can be cultivated. So it is believed that the germs thrown off from the

bodies of diphtheria and scarlet fever patients may find favorable conditions for their reproduction, may find a soil adapted to their perpetuation. There is no end of proof that there are many things besides the clothing worn by such patients which are capable of holding the infection in an active state for a long period. The many instances in which diphtheria is associated with filthy surroundings, with imperfect plumbing of houses, and the numerous outbreaks of diphtheria promptly after the opening and removal of the contents of cesspools, give strength to the belief that sewage may be a good culture medium for the perpetuation of the germs, if at any time the infection from a "previous case" may have been implanted in it.

There is another way in which bad plumbing and badly built sewers may contribute to the spread of these and other infections. Leaky sewers contaminate the soil, and bad plumbing admits sewer gases into the houses, which may carry with them micro-organisms. Persons exposed to these conditions are known to be more susceptible to disease, that is, more liable to take contagious diseases and less able to survive them, than others. Hence, when infectious diseases prevail, they find many more victims and a larger proportion of fatal cases in such circumstances than where the air is pure and the ground clean. In short, the "previous case" can be the source of the disease for a long time, and in many different ways, unless disinfection has been complete.—*Monthly Bulletin of the Connecticut State Board of Health.*

The Production of Oxygen from the Air.

The separation of oxygen from the nitrogen of the air has been practically effected by two processes, both of which depend upon: (1) The formation of higher oxides of certain metals, and (2) the elimination of the oxygen from the higher oxides by the application of high temperatures or of super-heated steam. It is well known, for example, that most of the oxygen used in London for limelight purposes, including, we should add, inhalation experiments, is produced directly from the air by means of Brin's expedient, which consists in exposing ordinary heated baryta (BaO) to air that has been freed from carbonic acid. The peroxide of barium (BaO_2), which is thus formed, readily yields oxygen on

the application of a higher temperature, the reduced oxide (BaO), which may be used again and again, remaining in the retort. Another method of obtaining oxygen from the air consists in heating manganate of potassium (KMnO_4) in a current of steam, when oxygen is evolved and caustic potash and the lower oxides of manganese are formed. The caustic potash and the reduced manganese are treated again in contact with air, when manganate due to absorption of the oxygen of the air is re-formed. So this process, like the last, is practically continuous. More recently a process which appears to offer certain advantages over others in vogue, though its action is more complex, has been studied, with the view of establishing it on a commercial scale, by G. Kassner, a German chemist. This chemist employs, in the form of spongy, porous masses, calcium plumbate (Ca_2PbO_4), a compound of lime with peroxide of lead, which being first exposed to moist furnace gases, absorbs carbonic acid and is converted into a mixture of carbonate of lime and free peroxide of lead. Then on heating this mixture in a retort, oxygen, at first in a state of purity, is evolved, but as the temperature rises it is contaminated, more or less, by carbonic acid, which is readily removed, however, by passing the gas over a column of the fresh plumbate. Towards the end of the operation, which is assisted by means of a current of super-heated steam, carbonic acid gas in a state of purity is given off. The residue in the retort, consisting of an intimate mixture of lime and litharge (PbO) is reconverted into plumbate by simply driving a current of air through the heated mixture in the retort. Thus the plumbate can be used over and over again in the same way that baryta or manganate is used in the processes previously described. The purity of oxygen is a matter of considerable moment, of course, when the gas is intended for purposes of inhalation. In industrial and other applications, too, it is necessary to employ fairly pure oxygen if good results are desired. Judging from recent literature on the subject of oxygen in its application in the arts and industries, there appears to be an increasing demand for a process which will provide a pure gas at a reasonably cheap rate. Of the individual processes described, however, experience must be left to decide which is best suited for the purposes in view. Already oxygen has been suggested as an effective agent in the purification of sewage, but as yet no practical success seems to have attended the efforts of the enterprising investigators.—*Lancet*.

The Proportion of the Defective and Sickly among School-children

has been shown in a striking way by a Committee of the London Charity Organization Society. After two years of labor they publish the results of an investigation into the physical condition of 50,000 school-children, all being children of the poor. It was found that of the 50,027 children, no fewer than 9186, or 18.3 per cent., were defective in some way or other. Examining these 9186 still further, we find that 5851 showed defects of development; 5487 presented abnormal nerve signs; 2003 were delicate, pale and thin; 3679 were reported by the teachers as being dull in school; 1473 showed eye defects; 67 were deaf; 239 were crippled, paralyzed, maimed, or deformed; 54 were epileptic; 234 were feeble minded; and 817 required special care and training. It is estimated that about 13 per 1000 need special care and training.

Cleanliness Brings Health.

Recently we read a very entertaining and instructive article from the *New York Times*, in which was described the method of cleaning the city of Paris, France. In that beautiful city they do not rely upon the sweeping machine and dump cart for cleansing the city, but they flush the gutters two or three times a day, and do it so thoroughly that the refuse of the streets and avenues is carried into the sewers and borne away beyond the limits of the city. It is this care of the city that has given Paris such a reputation for cleanliness, beauty and health. It costs the people of that city on an average seventy-five cents a year for each inhabitant to keep the city clean. This in the aggregate amounts to a large sum, but it is not as much for each one as a bottle of patent medicine would cost. It is not one-half the sum required to pay for one visit of a physician. Paris gains in the health of its citizens many times the cost of cleaning the city.

If the great cities of America would institute similar thorough methods in cleansing their streets and avenues, the average health of our country would be greatly improved. The life of our citizens would be prolonged, and the comforts of life multiplied and intensified. A wise policy for a city administration would be to cleanse the city at any cost. It is just as essential that we should have clean homes and streets as it is that we should have

clean food and clean water to drink. In fact, without clean homes and clean streets, it is impossible to have clean food, pure air, or pure water.

No better time was ever known for the inauguration of a policy of cleanliness than at the present. The recent ravages of cholera in Europe, and the danger of its entry into this country, have awakened people to the importance of providing against it. They would be willing to assist in carrying out an intelligent cleansing policy, by reason of their anxiety to ward off the disease and turn aside the messenger of death.

It is to be regretted that an appeal to people in behalf of the common decency of cleanliness is urgently necessary in the closing years of the nineteenth century. Cholera is but one of a great many diseases that dirt and filth and neglect engender. It comes but once or twice in a century, while no city in America is free for one day in the year from many enteric diseases that carry off many thousands from among our people. Looked at from the sanitarian's point of view, cleanliness is not only next to godliness, but it *is* godliness; for whatever gives health to the body, gives vigor of intellect and soul, and he who is vigorous in his mind and heart worships better, lives better and acts nobler. Let us, therefore, be clean.—*Scl.*



This department is designed for the description of improved Sanitary Appliances and Medicinal Preparations introduced by patrons of The Annals. The matter is not paid for, nor can it be classed as advertising. But as the information is necessarily obtained from those who offer the appliances for sale, it is proper to say that the manufacturers, rather than ourselves, are responsible for the statements made.

**In Dr. Seneca Egbert's "Lectures on Hygiene"
Appears This Paragraph:**

"RECENTLY there has been devised and put in use a gas heater, intended to not only perfectly consume the gas it uses, but also destroy by fire *all* of the impurities of the air in the room in which it is located, thus

doing away with the necessity of ventilation, or any supply of air greater than that necessary to furnish simply the oxygen needed by the inmates and by the fire itself. This may seem revolutionary in principle, but experience seems to show that the claim is well founded, and that the apparatus is healthful in operation. By a carefully regulated Bunson burner, the gas is so perfectly consumed that the only product is carbon dioxide, which is harmless in all ordinary quantities. By a peculiar arrangement, a continuous current of air is made to pass through the flame, thus burning all the impurities, whether gaseous or solid. The heat is also utilized to convert a quantity of water into steam, thus warming the containing coils of pipe, and, in turn, the air surrounding them. The ordinary opening of any room furnish all the ventilation necessary to allow the exit of the excess of CO_2 , and the ingress of fresh air containing sufficient oxygen, as above indicated. It seems certain, that after several hours use, there is no sense of impurity in the atmosphere, and that continued employment for months produced no harmful effect."

Can this be from the pen of him who wrote so valuable a sketch of practical means of ventilation? Or is it simply sarcasm? Is it possible for any thinking person to believe that less fresh air is needed when an additional source of contamination is introduced? Ordinarily he tells us a room should be supplied with at least 3000 cubic feet of air per person. With the gas heater a supply is needed "to furnish simply the oxygen" for the inmates and gas heater. The lungs of each man absorb 0.9 cubic feet of oxygen per hour. The gas fire will require probably 5.30 cubic feet of oxygen per hour. Then with this apparatus only 31.15 cubic feet of air are needed each hour. This, we are told, will keep the atmosphere so that "no appreciable harmful effects" are noticed. With an apparatus using five times the air of man, an air supply is needed equal to only about one one-hundredth what man requires alone! I am sure Dr. Egbert cannot for a moment think that the impurities from the lungs are all passed through the flame and so destroyed. It would not be possible except that the inmates breathed into a tube leading directly into the fire.

To my mind there is no apparatus in the market that has so little merit and that claims so much. The advertisements of the manufacturers that the apparatus "consumes every microbe," must cause all physicians to smile. The only feature of value is a burner that gives combustion very nearly perfect. These hot gasses thrown into the room give off a large amount of heat—all they hold, for they have no vent or exit from the room. The vessel containing water, with the steam chest above, does not add one heat unit. The entire construction and advertisement is, to my mind, one of *deceit*. It is no more healthful in a room than is the charcoal brazier, or grate, or stove, that has no chimney connection, and throws all the products of combustion into the room.

Can Dr. Seneca Egbert, or any physician who values his standing in a scientific or intelligent community, afford to praise such an apparatus?

WILL WALTER JACKSON.

THE ANNALS OF HYGIENE

PHILADELPHIA
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COMMUNICATIONS.

How Shall Our Lepers be Cared For?¹

BY BENJAMIN LEE, A.M., M.D., PH.D.,
Secretary of the State Board of Health of Pennsylvania.



UR LEPERS! When the writer, as well as many of those who listen to him indeed, was a student, such an expression would have seemed absolutely meaningless; as much so as the phrase "State Medicine," with which our ears are now sufficiently familiar. "Lepers!"

Of course, we had read about them in the Bible. There were Naaman, the Syrian, and the Samaritan whom Christ healed, but all that happened in the dim past, centuries on centuries ago. It is true that sometimes a traveler in the far East would return with the story that cases of the loathsome disease were still to be seen in out-of-the-way places, but little credence was given him. And now we talk of "Our Lepers;" and, unfortunately, have full justification for using the expression. We live in an age in which the ends of the earth are come together. So rapidly do we course around this little globe of ours that East and West have almost ceased to be, a few short days converting the one into the other. The secrets of the remotest India have been laid bare, revealing thousands—nay tens of thousands—of sufferers from this lingering torture, this living death; and the populations of the two hemispheres are

¹ Read before the World's Public Health Congress at Chicago, October 11, 1893.

rapidly inter-changing and commingling. And so it has come to be that the western world now also numbers its lepers by thousands, while fifty years ago only, the initiated knew that near a great city, in the extreme corner of the United States, lepers were lurking in an obscure out of the way village.

The State Board of Health of Pennsylvania and the Board of Health of the City of Philadelphia have had some unpleasant experiences with lepers which have led both of those bodies to appeal to the general government to establish a colony or colonies, where these unfortunates might be provided with the comforts of home and medical care and nursing and, at the same time might cease to be a horrid menace to the health of those with whom they were thrown in close contact. In order to arrive at a somewhat definite opinion as to, first, the need for the adoption of such a measure, and secondly, the general drift of opinion on the part of those who had given the subject a thoughtful attention, in December, 1891, I addressed circular letters of inquiry to the secretaries of all State and Provincial Boards of Health in the United States and Canada, and to prominent dermatologists. The letter to State officials was as follows :

COMMONWEALTH OF PENNSYLVANIA, STATE BOARD OF HEALTH,
Executive Office, 1532 Pine Street,

PHILADELPHIA, December 30, 1891.

To the Secretary of the State Board of Health of

DEAR SIR :—

Being desirous of obtaining reliable information as to the prevalence of leprosy in this country I request of you the very great favor of a reply to the following questions :

- (1) How many cases of leprosy have been observed in your State?
- (2) How many cases at present exist in your State?
- (3) Is any provision made for the segregation of lepers in your State?
- (4) Is any provision made for the shelter, support and medical care of lepers in your State, either by State or municipal authorities, by private societies or by individuals?
- (5) Has your board adopted any minute, resolution, or regulation with regard to lepers found within the borders of your State, such, for instance, as requiring the disease to be reported to boards of health as is done in the case of other communicable diseases?
- (6) Have you any knowledge of lepers having passed through your State, and, if so, in what sort of conveyances?
- (7) Are there reasonable grounds for supposing that there are lepers concealed in any of your larger towns?

(8) What is the Chinese population of your State and of your several large towns?

(9) Do you know of any cases of leprosy having originated in your State?

Two principal objects were had in view in this series of inquiries : First, to get at the geographical distribution of the disease in this country, and secondly, to discover to what extent its presence had been recognized and made the subject of official restriction or legislative enactment.

As regards the first point, viz., the geographical distribution of the disease, the attempt was made to obtain advance sheets of the United States Census Report for 1890, containing this information. The reply of Surgeon John T. Billings, in charge of that department is as follows. I ask especial attention to the last sentence, as it indicates very clearly the difficulty of obtaining definite and truthful replies to questions on this topic. Not only householders, but physicians as well, will be loath to disclose this dread secret.

WAR DEPARTMENT, SURGEON GENERAL'S OFFICE,
U. S. ARMY MEDICAL MUSEUM AND LIBRARY,
Corner Seventh and B Streets, S. W.,
WASHINGTON, D. C., January 12, 1892.

DR. BENJAMIN LEE,

Secretary of the State Board of Health of Pennsylvania, Philadelphia, Pa.

DEAR SIR :—

Yours of the eleventh instant is received. The information with regard to leprosy, contained in the census statistics, is not yet compiled, the work on the vital statistics having been suspended for several months owing to want of clerical force. As soon as the deficiency appropriation which has been asked for has been granted, I hope to have a number of clerks put on this work, and in the course of three or four months to be able to give you the information you desire, so far as the records of the census contain it. I fear, however, that they will be very incomplete as regards the existence of leprosy, since householders would not report cases if they could avoid it.

Very sincerely yours,

JOHN T. BILLINGS,
Surgeon, U. S. Army.

In the same line of thought, Dr. H. S. Orme, President of the State Board of Health of California, in his admirable essay, "Leprosy ; Its Extent and Control, Origin and Geographical Distribution" says, "I have no doubt that the practice of secret-ing lepers is general throughout the world, wherever the disease prevails, and it is not difficult, in an early stage for lepers to evade the authorities and go about their usual business." It does not

at all follow therefore that, because State officials are not aware of the existence of cases of leprosy within their borders, such cases do not exist.

Replies to these inquiries have been received in twenty-three instances.

They indicate, briefly, that cases of the disease have been recognized and made the subject of official report in seventeen States and provinces, viz.: New Brunswick, including Cape Breton, British Columbia, Massachusetts, New York, New Jersey, Pennsylvania, Maryland, South Carolina, Florida, Illinois, Iowa, Minnesota, Wisconsin, Nebraska, Louisiana, California and Oregon.

The authorities of twelve States and provinces have no knowledge of any case ever having been seen within their borders. These are Ontario, Quebec, Vermont, Connecticut, Delaware, North Carolina, Alabama, Ohio, Michigan, Indiana, Kansas.

In ten States or provinces cases exist at the present time under the observation of the authorities, namely, New Brunswick, twenty-two cases; British Columbia, seven cases; New York, six cases; Pennsylvania, four cases; Illinois, two cases; Iowa, one case; Minnesota, seven cases; Wisconsin, four cases; Louisiana, forty cases; California, twenty-four cases; making in all 117 cases. Comparing my own returns with the carefully prepared statistics of others, I am led to conclude that since the middle of the present century, about 625 lepers have been domiciled in North America, not including Mexico. The greatest number in any one State or province has been in California, owing to Chinese immigration, where not less than 200 have been registered, and the next greatest in New Brunswick, where the names of 132 are on record.

Original cases, by which I mean those in which the patients either resided on this continent and contracted the disease by contagion in this country, or those in which the patient had contracted the disease in other countries, but in whom it had given no sign of its presence before they came to this country, have been observed in seven States or provinces, viz: New Brunswick, Pennsylvania, Maryland, South Carolina, Minnesota, Louisiana, California. There is good reason for believing that cases of this description have occurred in Wisconsin and Iowa also. Now leaving the question of the geographical distribution of the disease, let us see to what extent State governments and sanitary

authorities have considered that its presence imposed any responsibility upon them to prevent its spread. We find only two legislative bodies which have enacted laws upon the subject, those of the Dominion of Canada and of California, in both of which jurisdictions the reporting of leprosy is made compulsory by special enactment. It is claimed, however, by the boards of health of several of the States, that the general provisions with regard to contagious diseases enable them to deal with leprosy as a contagious disease if they see fit. In three States the State Board of Health has adopted a special regulation requiring the reporting of the disease. They are Maine, Pennsylvania and California.

Segregation or isolation is required either by legislative enactment or by the sanitary authority in New Brunswick, British Columbia, Pennsylvania, New York and Wisconsin.

Provision is made for the maintenance and medical care of lepers in New Brunswick, British Columbia and Wisconsin by the State, in Pennsylvania and California by the county authorities. In Minnesota they are registered and kept under observation but are not prevented from mingling with the public.

The only boards which possess knowledge that persons infected with this disease may have passed through their territory are those of Ontario and California. It is evident from the records of hospitals and the admissions of private practitioners, however, that there is not a State in the Union through which they have not traveled.

The facts which we have arrived at, then, are first, that so far as the national governments are concerned, those of Canada and the United States have both put themselves on record as holding leprosy to be a contagious disease of such nature and character as to make it a menace to the public health and to entitle it to official recognition and oversight. The former has passed laws compelling the segregation of every case discovered, and at the well-known lazaret at Tracadie, in the province of New Brunswick, provision is made for the comfort, care and treatment of these unhappy beings in a manner in harmony with the dictates of humanity and the requirements of modern science, while at the same time they cease to jeopardize the health and happiness of others. The United States has only gone so far as to make the affection quarantinable at the sea coast and to order those found suffering from it on arriving vessels to be at once returned to the ports from which they came. In the different States of the Union the widest

diversity prevails both in theory and practice. The only place in which segregation is practised and at the same time humane provision is made for the shelter, maintenance, medical attendance and nursing care of lepers, is the city of Philadelphia. The manner in which the county authorities, who have the care of the other case in Pennsylvania, discharge this duty is by no means in keeping with the dictates of humanity or the laws of sanitation. The sole occupant of the pesthouse which has been assigned to him, his food is passed in to him as it might be to a wild animal. He has no attendant and is obliged to do everything for himself. Occasionally his loneliness becomes unbearable and he makes excursions into the surrounding country and even into neighboring cities. What will be his condition when he becomes unable to help himself is unpleasant to contemplate. In making this statement I am not desiring to reflect upon either the humanity or the intelligence of the poor directors or county commissioners. They are possibly doing as well as they can under the circumstances. The condition is owing to the failure of the national government to provide a refuge for this wretched being and for the hundred others like him who are dragging out miserable existences in different parts of the country. While their numbers are few, no little rural community—very few States even—feel justified in going to the expense of establishing a lazaret house or colony. Is it wise to wait until State after State finds itself compelled by their increasing numbers to take this step, or is it not rather the duty of the central government to gather them all into one properly supervised community where they can have the companionship of their fellows, the comforts of a thoroughly furnished home, and the advantages of the best medical and surgical skill?

Such is the distinctly-expressed opinion of nineteen of the twenty-one eminent dermatologists, who favored me with replies to my circular of inquiry. I may, perhaps, be allowed to quote briefly from some of them.

Dr. James C. White, of Harvard University, says: "The disease is bound to increase with all these foci in our midst, if the national government do not take immediate steps for its segregation, while it yet remains in manageable numbers." "I favor the foundation of a national asylum with perpetual isolation, and the establishment of local hospitals, or special wards for observation and determination of diagnosis."

Dr. H. G. Piffard, of New York, remarks of the establish-

ment of a national leper colony: "This will have to be done sooner or later, and the sooner the less difficulty in the undertaking."

Dr. Charles W. Allen, of New York, considers that "Public welfare demands that some law be enacted by the national government, which will prevent lepers from entering this country from any side, and compel those now here to enter a suitable hospital. State legislation will not furnish the necessary relief, for if we prevent lepers from entering at large in one State, they will only be driven to some other part of the country."

It is a question of national interest, and must be settled on the basis of what means will prevent a national calamity. Segregation has been proved to be the only sure means of freeing a country from the ravages of this disease. It is the duty of the government through national legislation to establish one or more central leper hospitals or isolated settlements for the segregation, care, and scientific treatment of those afflicted, and for the protection of the community at large. I do not desire my reply to be confidential. In fact I deem the question of such importance that any facts relating to it, if they can help to bring about the suitable means of freeing the country from so dire a disease, should have the widest publicity."

Dr. John T. Bowen, of Boston, says: "Isolation of the infected with all precautions as to antiseptics and cleanliness are imperative."

Dr. Samuel Sherwell, of Brooklyn, while not convinced of the necessity for segregation in this climate, holds that if so considered, "it would, undoubtedly, be best attended to by the central government, and the selection of an isolated spot where temperature and hygiene were both favorable, in this way securing one focus only, instead of numerous foci, for the spread of possible contagion."

Dr. George Thomas Jackson, of New York, thinks that, "the best means of preventing the spread of the disease would be by the establishment of leper colonies by the national government in different sections of the country in which the disease is most commonly met with."

Dr. R. H. Daly, of Pittsburgh, says: "The time has come when the national or State legislators ought to take some adequate action to prevent the ingress of lepers into the United States,

and also to forcibly isolate those already within our borders. It is, therefore, the duty of the profession to instruct the legislators and the public upon this question. It is a matter of congratulation to Pennsylvanians that their State Board of Health had recently sent to the profession circulars making inquiries for the purpose of urging legislation. But the profession can do little or nothing without the aid of the public, who are indebted to the unselfish recommendations of the medical profession for light in matters of public health. Hence the public ought to be informed as to the needs of the hour, and urged to act through their representatives."

In conclusion I desire to say that in determining the importance of this question, and the necessity for governmental interference, the numerical method is entirely misleading. One case of leprosy outweighs 100 of any other disease. If there were but ten lepers in the land, instead of more than ten times ten, it would be equally the duty of Congress to initiate measures to prevent, if possible, a single addition to the horribly afflicted company. Listen to Dr. Daly's description of an unfortunate, one of our own countrymen, whom he observed in Havana. This was a native of the United States, named Joseph Miller, one of the survivors of the massacre of the crew of the filibustering ship "Virginus," in the year 1872.

At the time of his rescue he was a hale and hearty dark mulatto, but thirteen years of leprosy had turned him white; it had also made him handless, footless, sightless, noseless; it had left him without ears; it had left him without what would be recognized as a human voice; it had left him a hideous, ghastly creature, without hope in life; a mere thing whom to look at is to make the stoutest heart shudder; whom to touch is to take the greatest possible risk of contagion that is sure to destroy. And such destruction—no other cruel thing known is so cruel—a weary journey of years with weary limbs, over which there is no power; shunned as no other being is shunned, cast out as unclean, to await the day when the horrible, hideous mass of decay will cease to live.

The Water Supply of Chicago: Its Source and Sanitary Aspects.¹

BY ARTHUR R. REYNOLDS, M.D.,

Commissioner of Health of Chicago,

AND

ALLEN HAZEN, S.B.,

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CHICAGO receives its water supply from Lake Michigan through tunnels at four different points, Lake View, Chicago Avenue, Fourteenth and Sixty-eighth Streets, varying from one to four miles in length. Within a few months extensions now in course of construction at Lake View, on the north, and Hyde Park, on the south, will be completed, and no water will be received in the city from a source nearer than two miles from the shore.

The first tunnel constructed was at Chicago Avenue, was five feet in diameter, and completed March 25, 1867. A seven-foot tunnel, parallel to the five-foot tunnel, was completed July 12, 1874, each two miles in length, to an intake common to both.

The Hyde Park tunnel, seven feet in diameter, and extending one mile, was completed July 22d, 1885, and has been the only source of supply at that point since.

The Lake View tunnel, six feet in diameter, and extending one mile into the lake, was completed April 5, 1892.

The four-mile tunnel, at Fourteenth Street, was completed December 8, 1892. It consists of two tunnels, each six feet in diameter, extending two miles to join an eight-foot tunnel, extending to the four-mile crib.

The capacities of the tunnels are as follows:

Chicago Avenue	130,000,000	gallons in twenty-four hours.
Sixty-eighth Street	72,000,000	" " "
Lake View	72,000,000	" " "
Fourteenth Street	140,000,000	" " "
Total	414,000,000	" " "

¹ Read before the World's Public Health Congress, at Chicago, October, 1893.

From the Chicago Avenue works to the Twenty-second Street pumping station there is a tunnel seven feet in diameter and four miles in length, passing under the Chicago River and the south branch, which is intersected at Harrison Street works by a seven-foot tunnel from the Fourteenth Street works.

The water is pumped into the mains by twenty-six engines, as follows:

Six pumps at Chicago Avenue, . . .	with a capacity of	96,000,000	gallons.
Nine " " Sixty-eighth Street . . .	" " "	77,000,000	" "
Two " " Twenty-second " west side, " " "	" " "	60,000,000	" "
Three " " Fourteenth Street, . . .	" " "	54,000,000	" "
Two " " Central Station, Harrison St., " " "	" " "	36,000,000	" "
Four " " Lake View, ...	" " "	30,500,000	" "
Total		353,500,000	" "

The water from the Lake View works supplies Lake View, Twenty-fifth and Twenty-sixth wards, and part of Jefferson, the Twenty-seventh ward.

Hyde Park works supply Hyde Park, three wards, and Town of Lake, Twenty-ninth to Thirty-fourth wards. The old city is supplied from Chicago Avenue and Fourteenth Street, with a main leading from Fourteenth Street tunneled under the river to the Town of Lake, Twenty-ninth, Thirtieth, and Thirty-first wards. All, however, are so constructed that the water from Lake View may supply Hyde Park, and *vice versa*.

Before the construction of the Fourteenth Street and Lake View tunnels, Lake View was supplied by water taken from the lake through several iron pipes laid upon the bottom of the lake, and extending from 1400 to 2000 feet into the lake, about fifty feet apart.

With the great growth of the city the Chicago Avenue tunnels were not sufficient to furnish water for the Harrison and Twenty-second Street pumping works, so that some six years ago a short additional tunnel was extended 3000 feet, at Chicago Avenue, for fire emergencies, which at various times during those years, particularly in 1892, was in use in common with the two-mile tunnel.

From Belmont Avenue, north, sewers empty into the lake every half mile. The largest of these is at St. Lawrence Avenue, one-half mile to the north of the Lake View pumping station.

On the south side, at Twenty-second Street, Thirty-fifth,

Forty-third, Fifty-first, Fifty-sixth, and Seventy-first Streets, sewers empty into the lake, while all other sewers empty into the river.

During times of freshet there is a current in the river to the lake, which, of course, carries sewage with it ; consequently water taken from the shore intake at Chicago Avenue must be more or less polluted with sewage. The same will apply to the old intake through the iron pipes at Lake View.

From the junction of Fullerton Avenue and the north branch of the river there is a tunnel extending to the lake through which water is pumped into the north branch, and which has a capacity of 147,750,000 gallons per twenty-four hours, which is used to flush that part of the river when required.

At the junction of the south branch of the Chicago River and the Illinois and Michigan Canal there is a pumping station, which pumps water from the south branch into the Illinois and Michigan Canal, which conducts it south to the Illinois River, and ultimately to the Mississippi River. These works are now pumping 407,936,000 gallons per twenty-four hours, and the capacity will soon be increased. These pumping works, except in times of heavy rainfall, will, because of the sluggish character of the Chicago River, produce a decided current in it from the lake toward the pumps, so that it is only in times of freshet that the Chicago River flows into the lake.

• The extensions of the various tunnels within the past two years have undoubtedly secured for the city a water less liable to sewage pollution than was formerly obtained. The available analyses of the water are perhaps inadequate to accurately measure the improvement, but fortunately we can apply that most satisfactory of all water tests, the typhoid fever death-rate test.

The improvement in the water intake has not all been made at a single date, but if we compare the two years ending September 30, 1892, and September 30, 1893, we find that during the earlier year the shore intake at both Lake View and Chicago Avenue were in common use, while the four-mile tunnel was not yet opened, while for the greater part of the latter year the shore inlets were entirely closed, and the four-mile tunnel at Fortieth Street and the one-mile tunnel at Lake View were in use.

The improvement in the death rate from typhoid fever with these changes in the water supply is well shown by the following table of the rates in the various wards of the city and in public institutions for the two years :

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TABLE SHOWING DEATHS FROM ALL CAUSES AND FROM TYPHOID FEVER,
BY WARDS, FOR TWO YEARS ENDING SEPTEMBER 30, 1892,
AND SEPTEMBER 30, 1893.

YEAR ENDING SEPTEMBER 30, 1892.				YEAR ENDING SEPTEMBER 30, 1893.		
WARD.	DEATHS FROM ALL CAUSES.	DEATHS FROM TY- PHOID FEVER.	PERCENTAGE OF DEATHS FROM TY- PHOID FEVER.	DEATHS FROM ALL CAUSES.	DEATHS FROM TY- PHOID FEVER.	PERCENTAGE OF DEATHS FROM TY- PHOID FEVER.
1	329	9	2.73	320	4	1.25
2	439	20	4.56	451	9	2.00
3	498	34	6.83	483	9	1.86
4	424	20	4.72	437	10	2.29
5	967	79	8.17	843	20	2.37
6	1,133	73	6.44	1,136	36	3.17
7	712	43	6.04	680	19	2.79
8	682	32	4.59	682	13	1.91
9	912	36	6.14	850	26	3.06
10	1,019	60	5.89	1,180	34	2.88
11	587	37	6.30	494	16	3.24
12	863	59	6.84	966	21	2.17
13	704	43	6.11	686	23	3.36
14	868	62	7.14	880	23	2.61
15	960	73	7.60	995	25	2.51
16	1,306	97	7.43	1,187	24	2.02
17	594	43	7.24	438	8	1.83
18	413	20	4.83	375	8	2.18
19	969	40	4.13	931	11	1.18
20	457	42	9.19	392	13	3.32
21	546	38	6.96	511	13	2.54
22	614	40	6.51	523	13	2.48
23	831	68	8.18	657	16	2.43
24	369	28	7.59	332	6	1.81
25	418	24	5.74	423	11	2.60
26	710	38	5.35	654	19	2.90
27	188	12	6.38	226	7	3.10
28	227	8	3.52	230	4	1.74
29	629	24	3.81	704	16	2.27
30	1,168	52	4.45	1,441	34	2.36
31	439	23	5.24	597	11	1.84
32	464	25	5.39	507	12	2.37
33	621	33	5.31	332	22	2.64
34	632	35	5.55	670	23	3.43
P. I. ¹	2,404	400	16.64	2,331	153	6.56
C. C. ²	1,550	..	..	1,933	..	..
Total	26,646	1,790	6.72	26,977	712	2.64

¹ Public institutions.

² Coroner's cases.

The total number of deaths by months since 1890 are shown by the following table :

TABLE SHOWING DEATHS FROM TYPHOID FEVER IN CHICAGO BY MONTHS.

	1890.	1891.	1892.	1893.
January	53	67	311	41
February	136	61	187	30
March	103	71	76	41
April	45	136	56	58
May	82	408	70	56
June	107	167	55	60
July	86	200	211	55
August	115	182	179	76
September	95	198	138	86
October	72	171	92	..
November	67	150	67	..
December	47	186	47	..
Total	1,008	1,997	1,489	..

It is most unfortunate for this comparison that the old supplies were partially in use during the first two months of the latter year, before the four-mile tunnel was opened, and we may believe that if this had not been the case, the comparison would have been still more favorable to the improved supply.

It is a well-known fact that people using a water supply to which they are not accustomed are often more susceptible to any infection which it may contain than are those using such water regularly. A striking illustration of this was furnished by Philadelphia in the centennial year when the typhoid death-rate was nearly doubled, while in Chicago, in the present year, for the first months of the fair period, the rate has been less than half as high as for the corresponding months of the preceding year, and for the entire years under consideration, in spite of the vast number of visitors continually present in Chicago, there has been a reduction of over 60 per cent. in the percentage rate.

The mortality percentages from typhoid fever for the two years as given above, have been put upon two maps of the city, showing the water intake and sewer outlets in use for the respective years.

The reduction of the death-rate from typhoid fever in one year of over 60 per cent. is most striking, and it can hardly be doubted that the improvements in the water supply have been the chief if not the only cause in this gratifying reduction.

It is to be noted, particularly, that there is no very marked local distribution of the disease. In the earlier year there was not a ward in the city without an excessive rate. The so called best wards suffered almost equally with the poorer wards, and the wards on the lake shore were not more favored than those along the Chicago River. The only general difference to be observed was that those wards supplied with water from the Hyde Park intake had somewhat lower rates than the rest of the city, and during the past year, with the improved condition of the other intakes, this difference has disappeared.

As there is no marked local distribution of the typhoid fever, so there were no exceptions to the general improvement with better water supply. There was not a single ward in the city which did not show a substantial reduction, although, as might be expected with such a complex problem, the percentages in the different wards varied somewhat.

The lessons of the maps may be summed up as showing a general cause of the typhoid fever in the city only slightly affected by local conditions, and a general improvement in the death-rate with improved water supply without any local exceptions whatever. Stronger evidence could hardly be produced even if additional proof was required to show the casual relation between the contamination of the water supply and the typhoid fever.

The mortality percentages from typhoid fever in a number of cities for the last year for which we have the data is as follows:

CITY—YEAR ENDING SEPTEMBER 30.		DEATHS FROM ALL CAUSES.	DEATHS FROM TYPHOID FE- VER.	MORTALITY PERCENTAGE FROM TYPHOID FEVER.
Chicago,	1892	26,646	1,790	6.72
"	1893	27,000	700	2.60
Philadelphia,	1892	24,305	539	2.22
Boston,	1892	11,236	137	1.22
Paris,	1891	54,443	549	1.01
New York,	1892	44,317	399	.90
Brooklyn,	1892	20,952	162	.80
London,	1892	86,355	424	.49
Berlin,	1892	32,696	137	.42

The cities having the lowest typhoid fever death-rates given above, London and Berlin, use only filtered water. London draws nearly all of its water, for some 4,000,000 or 5,000,000 of people, from the grossly polluted rivers, the Thames and the Lee, and after

filtering it supplies it to a population that is almost free from typhoid fever.

Among the improvements which will eventually still further protect the purity of Chicago's water supply may be mentioned the drainage canal. After its completion with the construction of a complete system of intercepting sewers along the entire lake front, the sewage will be turned from the lake to the Mississippi River.

In the meantime it may be a question worth considering by the engineers whether filtration would not be as cheap and effective a means of improving the supply as the further extension of the tunnels.

Reminiscences of the Cholera Epidemic at Vicksburg, Mississippi, in the Year 1866.

H. B. OSBORN, M.D.,
Kalamazoo, Michigan.



THE secular press for the past year has teemed with reports of the cholera epidemic raging in the various cities and provinces of Europe, and calculated on the certainty of a visit from the dread scourge to our country during the summer months of this, our Columbian year. And when a ship-load of infected emigrants arrived in the city of New York late in the season of 1892, the wiseacres obtained the right of way, built the road and issued tickets to his majesty, Cholera Asiatica, with stop-over privileges, and gave minute directions as to the particulars of landing at Quebec, and the number of days he would take before reaching Michigan's queen city, and the Herculean jump he would take from Detroit to Chicago, and so vividly were these pen pictures drawn, that to the experienced and unexperienced mind scenes of death and desolation were a reality, and Jackson Park was turned into a general emergency hospital instead of the grand exposition we had hoped to see.

The mind's eye could see the broad lines reaching from the Atlantic coast and from the Pacific slope converging to Chicago, lined with people, like pilgrims going to the sacred shrine, myriads dropping out to die, and their bones left to bleach on the roadsides, before a sight of their Mecca and its shrines were obtained.

What a picture to draw! What consternation was wrought by this sensationalism so dear to the public press. This was not all. The medical journals also took up the refrain, but in a different key and with a different intent. Anticipating the possibility of a visit, the profession were warned and furnished with the best therapeutical armamentarium now known to the profession to fight and down the enemy.

How different twenty-seven years ago! The clinical thermometer not known, and the hypodermic syringe a rare thing and not in general use in the army, and but slightly known to the profession outside our larger cities.

During the early summer months, in the year 1866, while in charge of the United States Marine and United States General and Pest Hospitals at Vicksburg, Miss., rumors reached us of the presence of cholera in the city of New Orleans. The Cincinnati papers, that reached us, gave us the most reliable accounts of the epidemic, while the papers reaching us from New Orleans were silent on the subject. Our own city papers casually remarked that it was rumored that cholera had made its appearance in the Crescent City.

The medical director, Surgeon John Moore, ordered a general renovation of the military camps, and everything put in order for what might come, while the city, which had passed from military control, lapsed from a cleanly city to its old malodorous condition, and the citizens again dumped the offal of fish and fowl with the accumulation of bed-room and kitchen garbage just outside the back door, as food for the buzzard and the flies, and to regale the nostrils of the native and fill his soul with joy and full realization of the fact that things were as they used to be "befo' the wah."

The sanitary condition of the city was typical of the ordinary southern city, with a set of inhabitants just home from the war, discouraged and Micawber-like, waiting for something to turn up. July 20, 1866, about 2 P.M., I was called to Ward A, United States Marine Hospital, to see H. C., a strong, muscular colored

man, who, while sanding the floor, had been taken with "cramps." I found him bathed with cold sweat, hands and extremities cold and shrunken, pulse 120 per minute, with a spasmodic contraction of the gastrocnemii and of the recti femorum. He had a pail of water near his cot and a pint cup in hand, which he would fill and empty at a draught, and as quickly would it be ejected from his stomach, and then with a bound he sought the closet stool, when a copious discharge of milk-and-water-colored fluid was passed from his bowels, the odor of which was unlike that of ordinary fecal matter. It was the odor of stale meat and was acid in reaction.

The treatment adopted was hot applications to the extremities and Squibb's diarrhœa mixture given in oft repeated doses. The medical director was summoned, who, after looking at the patient a moment and learning from him that he did not feel sick at dinner time, and that he had eaten only the regulation hospital diet, turned to me and in a quiet manner remarked: "They are having cholera in the camp of the 17th U. S. Infantry; give your patient what in your judgment seems best."

We turned to our patient and found him with the tin cup grasped in his hands, partly filled with water, stiff and dead. Just an hour and thirty minutes from the time I first saw him he was on the "cooling board" in the dead house. A cook and a laundress went the same way before 10 o'clock P.M.

That evening I referred to my text-books as to causation and treatment of the disease before retiring, and spent the greater share of the night in the hope of finding some help or consolation, but how meagre and unsatisfactory! The text-books told us that the disease was caused by an accumulation of acrid bile; that poverty, filth and intemperance were factors in causation, and that eating stale meats and fruits was another cause; that the whole materia medica was before us to select our remedies from, and those which promised some benefit were mentioned as follows: Calomel in large doses, opium, brandy, chloroform, sulphuric acid, cajiput oil, castor oil, croton oil, lac sulphur, sugar of lead, logwood, emetics, oxygen, hot air, sulphate of magnesia and venesection.

We also learned that in the epidemic in England, in the year 1849, there were 53,292 deaths from epidemic cholera, and 18,887 from choleraic diarrhœa in the United Kingdom, and this was about all the books had to say, except the pages of statistics and

the mortality in various localities, and recommending water *ad libitum* and pure air.

We were no longer in doubt as to what we had to deal with, but were very much in doubt as to the best manner to deal with it, but we began a systematic study of each individual case, and did our best to meet the indications as they presented themselves.

The next twenty or more cases were marines or detailed soldiers, who were brought to us either in the second stage of the disease or in a state of collapse, and died in a short time after admission, or were taken to the receiving room and removed to the dead house, in many instances, before their names were known. Soon, however, we had opportunity to study incipient cases, and took careful note from the first appearance of the disease to its finish, which I will repeat to you as taken.

The disease has no lengthy prodrome. The victim may be about his usual business when he is warned that something is wrong by a spasm of the rectus abdominis muscles and a slight pain in the calves of the legs, and while he is taking mental note of his sensations, a sudden call to evacuate the alimentary canal is so imperative that every other duty is suspended for it. This act accomplished, he feels fully assured that he will be all right, and is surprised at the ease with which the bowels are emptied. The stool on examination is found to be nearly normal in character, with the exception of the amount passed. He resumes his occupation, feeling only a slight epigastric heat that a drink of ice-water will relieve, and if obtainable, it will be ice-water that he will drink, and probably two or three glasses before the desire is slaked; then there come the cramps in the limbs and a rigid contraction of the abdominal muscles and a repetition of the desire to seek the closet, and while on the stool general muscular cramps come on, and with it spasmodic contractions of the stomach, ejecting its contents. The contraction is not due to sickness at the stomach or nausea, and does not cause that mental depression that ordinary nausea would. Mentation is clear. As soon as the cramp is over and vomiting ceased, the patient immediately seeks for the cooling draught of water, which is almost immediately ejected. As a rule, aside from the food that is first thrown off, nothing is seen in the matter vomited except the water or medicines taken, no bile, coloring matter, or blood.

The pulse that has been normal, or nearly so, now becomes quicker and weaker in action. The sudoriferous glands now seem

to become preternaturally excited and the whole body becomes bathed in perspiration which trickles down the cheeks or fingertips. The animal heat seems to depart from the body as if by magic, general capillary engorgement takes place, the face and hands become cyanosed, the lips blue, the eyes sunken, and face drawn. The sphincter muscles become relaxed, enemata thrown into the bowels are not retained, every absorbent vessel seems to have acquired a reversed action and all the watery fluids of the body are poured into the alimentary canal and either are forced away by spasmodic intestinal contractions or trickle from the anus as water from a tube. Venous stasis becomes general, the blood becomes so thick and sluggish it will no longer circulate. The heart action becomes quick and feeble, the breath shallower, and while the patient is endeavoring to drink, or is attempting to smile and say he feels better, his restlessness ceases, the eye becomes glazed and the heart ceases its action and the patient is dead, his hands and limbs remaining in the position in which he drew his last breath and so remain for hours, and to all appearances rigor mortis is fully established. At death no warmth can be discovered over the body, and what is peculiar, the breath of the patient is cold during the second and third stages of the disease.

Post-mortem changes are almost of a negative character. The cortical portion of the kidneys are engorged with venous blood. The bladder is empty and has been so since the first stool, the mucous coat of the bowel is usually œdematous, with venous engorgement and ecchymotic spots from rupture of over-distended capillary vessels. The liver is normal in appearance, the bile cyst is, as a rule, not over-distended, the fluid contained is not viscid, and normal in appearance. The right heart is filled with a thick, tarry blood, and the same is true of the ascending *vena cava*. There is usually a fibrinous black clot hanging to the aortic valves. The lungs and brain present a normal appearance aside from the venous engorgement of the falx and lateral sinuses.

Nearly all the cases in the outset of the epidemic died in from two to three hours after the attack, and in nearly all of them was observed the muscular contractions that occurred after death. The bodies were placed in the dead-house awaiting burial, and while there were under general inspection every hour at least, and it was of frequent occurrence that the corporal of the guard would rush into the office and announce that one of the supposed

dead men was alive, for the guard saw him draw up his legs and kick his fellow. In the first instance we repaired to the dead-house and, to our surprise, we found the bodies warm, and a puff of air or a touch would excite this muscular contraction, and several fruitless attempts were made at resuscitation, induced by the returning animal heat and muscular contractions, which we found to be the case in all who died of epidemic cholera.

The treatment generally adopted was, on first appearance of the disease, to give full doses of calomel, ipecac and opium, oft repeated, and if the patient vomited bile, or had a yellow stool, we felt sure of a speedy convalescence. If the disease remained unchecked, we then gave Squibb's diarrhœa mixture, and insisted on perfect quiet in bed. If the pulse began to flag we gave strychnine, in $\frac{1}{30}$ gr. doses, until $\frac{1}{4}$ of a grain had been given, then digitalis and carbonate of ammonia, coupled with dry heat applied to the extremities, with cold to the head.

We finally stumbled on a line of treatment, which we believe did much to save many. It was the custom to sprinkle liquor sodæ chlorinatæ over the soiled clothing, and into the closet stools in the wards, because of its supposed antiseptic properties. This preparation was standing in the room of a patient who was apparently approaching his end. The nurse poured out some Labarraque's solution in a glass partly filled with water, and left the room for a moment at various intervals, and finally, when it became necessary to use his solution, it was gone. The patient acknowledged that he had drank it and felt better. The circumstance was reported to us, and as the man assured us that it made him feel better we made a solution eight or ten times weaker than the original and gave it. The cramps ceased, and diarrhœa checked, reaction came on, and the patient made a good recovery.

After this we gave our patients sodium bicarbonate, and chlorate of potassæ, in small and frequent doses, and with good results, and, as soon as the diarrhœal condition was relieved, we gave aromatic sulphuric acid and quinine. Milk and broths were the principal diet, until the kidneys resumed their functions and the stools assumed a golden-yellow hue. Then a mixed diet with fruits and vegetables was given.

During this epidemic the atmospheric conditions were peculiar. The thermometer registered 100° to 126° in the shade, from June 20 to October 15; the winds were south and southwest,

and but very little rain fell. October 15, a heavy wind came from the north, and continued for several days, and the epidemic ceased as suddenly as it came.

The sequelæ following an attack were usually those of a low-continued fever, albuminuria, and jaundice. The intemperate were the first to suffer, and died the quickest. Pregnant women recovered as a rule. The disease attacked more adults than children. Blacks and whites suffered in about the same proportion, and the native stood no better chance than the hardy northern soldier.

All this occurred over a quarter of a century ago, since which time bacteriology and aseptic treatment for visceral affections have shed new light, and added new lustre to the success of the profession in meeting and vanquishing disease.

The etiology of this disease, I believe, will soon be thoroughly understood, and the therapy so simple that the prophecy of M. Pasteur will be verified, viz.: that it is in the power of man to cause all parasitical or germ diseases to disappear from the world.

The Hygiene of Color.

There is undoubtedly a *hygiene* of color, and this is especially true in small cities and towns, and in the open country, where bad taste is quite frequently noticeable in painting of buildings. A thing of beauty is a joy forever, and a well-painted house certainly tends to make the inmates happier and healthier, and to exert a pleasant influence in many directions. A house painted with glaring and ugly coloring exerts a depressing influence, sometimes amounting to such melancholia as may alone be the means of disastrous results.

Good taste is an important element in making home healthy and happy.

All that tends to increase legitimate pleasure, like music, art, pleasing landscape, good taste and agreeable impressions in general tend to longevity. The painter, if he be but a house painter, has in his power opportunities to teach useful lessons in life.—*New York Medical Times*.

The Collection and Disposition of Animal and Vegetable Waste in the City of Milwaukee.¹

BY U. O. B. WINGATE, M.D.,
Commissioner of Health, Milwaukee, Wis



THE city of Milwaukee is located eighty-five miles north of Chicago. It has a population of about 260,000, and has been for several years, and is now growing, at the rate of about 1000 per month.

As early as 1879 the city began to grapple with the "garbage problem," and it has been a long and serious struggle until a recent date.

One of the first problems that was very satisfactorily settled at an early date was the enforcement of an ordinance requiring citizens to keep garbage and offal from being mixed with ashes and other rubbish. This was accomplished by having circulars struck off, and thoroughly and often circulated through the city by officers of the health department and those engaged in the collection of garbage.

Almost every known method has been tried by the city for the disposition of this material. It has been fed to swine; it has been ploughed under ground by farmers; it has been buried; it has been pitted; attempts have been made to burn it in everything from a cook stove to the most elaborately constructed crematory, but there did not seem to be any satisfactory solution of the problem.

The health department in times past has been literally flooded with all kinds of schemes for the disposition of this material. Every one who had a scheme was sure that his was the proper one to adopt. The health officer was placed continually between two fires, the public on one side demanding the removal and destruction of their garbage, on the other a string of schemers pouring in their plans to settle the problem. Why the health officer was not driven to an insane asylum must remain a mystery.

In 1888, after a struggle with several systems of cremation, the city entered into a contract with a company for a term of three

¹ Read before the International Congress of Public Health, Chicago, October 11, 1893.

years for the disposition of garbage and small dead animals by a system which utilized this material and did not destroy it, but converted it into merchantable products. But the plant in which this system was to be used was built in a very unfortunate location inside the city limits, being situated in close proximity to several slaughtering establishments, and near an open marsh which had been used for several years as a dumping ground, and which in hot weather emitted all kinds of odors. No complaints were made against this plant except during the summer months; and every odor that emanated from this locality was laid at the door of the garbage plant. Careful investigations were made both by the health department and by citizens, and there were about as many ideas expressed concerning the source of the nuisance as there were complaints against the same, but there was a very strong opposition to having the plant located in that locality, and appeals came in often to have it closed. As the cool weather came on, and during the winter months, complaints ceased.

The collection of this material was made by the city under the supervision of the health department, and was very satisfactory. At that time about thirty tons of animal and vegetable refuse from the table and kitchen, including small dead animals, such as dogs, cats and rats, etc., and the confiscated meat and vegetables condemned by the health department were disposed of in this plant daily.

In the summer of 1891 it became evident to the health department that the plant was being overworked; the water supply was not sufficient for the purpose of condensing gases properly, the building had become shaky and the machinery was not working properly; offensive gases were escaping and creating a nuisance, and, not from the fault of the process; but from the location, construction and management of the plant, it was deemed advisable to close the plant a few months before the expiration of the contract.

There was a great deal of trouble just before the plant was closed, caused by complaining citizens who claimed that the "Garbage Factory" was a great nuisance; but more trouble was in store as soon as the plant was closed. An attempt was made to dispose of the garbage for a while on farms outside of the limits of the city, but the towns promptly put an injunction on such business. The only relief for the city then was to dump the garbage into Lake Michigan. The custom of collecting the garbage

had been established in the city, and the people demanded the garbage collected by the city, and the health department must dispose of it in some way. The city attorney decided about this time that there were no provisions of law authorizing any city official to make a contract with any company or person for the disposition of this material, but there was power given to the commissioner of health to employ as many teams as were necessary for the collection of this material and to remove the same to such place or places as the commissioner of health might direct.

There was no plant in which it could be consumed or treated, and the adjoining towns prohibited its being taken within their limits. There was but one course to pursue, and that was to dump it into the lake. Here the fishermen objected, and instituted injunction proceedings, but were beaten in the courts and the injunction dissolved.

In the winter following, 1891-92, the State legislature passed an act authorizing the common council of the city to enter into a contract for the disposition of this material, with the advice of the mayor and the commissioner of health. Then began a siege with the schemers again. All kinds of plans were suggested, and every one who suggested a plan was sure that his plan was the best. Much vexatious delay, of course, occurred. The mayor and commissioner of health advised the common council, but the common council were not obliged to follow their advice under the law, and they took the matter into their own hands and made an attempt to settle the problem.

In the meantime the commissioner of health was besieged on one side by a certain class of citizens to stop dumping the garbage into the lake, for fear of contaminating the water supply, and a continuous demand on the other side of all citizens to collect and remove their garbage. It was made a political matter, and the city had what will go down to history in city-politics as the "Garbage Campaign of 1892." Finally, the council adopted a resolution to send a committee, consisting of the mayor, city engineer, president of the common council, and the commissioner of health, to different cities to investigate the different methods of disposition of garbage, and to report with recommendations to the council. In February, 1892, this committee completed its work, but the council were not satisfied with that, and made a tour of investigation themselves, but finally returned and adopted the recommendations made by the committee sent before, which was the

same as recommended by the commissioner of health a year before.

It was decided to let the contract for five years to a company, who would build a plant fourteen miles out of the city, collect and remove to said plant all garbage, offal, dead animals, both great and small, and animal matter, of the city of Milwaukee, including refuse matter from commission houses, etc., to said plant, in which they would dispose of it in a sanitary manner, satisfactory to the mayor and commissioner of health.

This contract went into effect, and the work was commenced in June, 1892. The contract required that the company should collect this material under the supervision and control of the commissioner of health, and that at any time when the collection was imperfectly done, or the work of collection, transportation, or at the plant was not conducted in a sanitary manner, the commissioner of health should have power to discharge men, and demand that competent ones be put in their places, or to refuse payment for work done which was not satisfactory.

The material should be collected in steel, air-tight tanks, and conveyed to the plant without creating any offence or nuisance. Said collections to be made from residences three times a week in summer, and twice a week in winter, and from hotels and restaurants daily, and oftener if required by the commissioner of health, and that dead animals should be removed at once, as soon as the company was notified of their whereabouts; the company to provide the extra wagons, to be ready for urgent calls at any time, and stationed near the health department.

The company should transport this material to the plant either by boat, or on cars, the station for loading to be approved by the commissioner of health.

The city was to pay the company for the collection, transportation and disposal of this material the sum of \$68,000 for the first year, with an increase of \$2000 per year, to the end of five years, at which time the city can enter into a new contract with the company, or purchase the entire outfit of the company, including the plant, teams and transportation facilities, at a price to be fixed by arbitration, one arbitrator to be appointed by the city, one by the company, and the third by the other two arbitrators.

The company constructed a plant at an expense of some \$110,000. They purchased a powerful steam barge for transpor-

tation; they put on fifty steel, air-tight wagon tanks for collection, and two large covered wagons for the collection of large dead animals. Garbage is collected between the hours of 4 A. M and 12 M., and the boat leaves with its cargo for the plant at 1 o'clock P.M., daily, returning the same evening to be ready for service of the collectors the next morning.

Since the 1st of September, 1892, the plant has been in operation to the satisfaction of the city officials of Milwaukee, creating no nuisance or stench whatever, that can be reasonably objected to in its location, and the collection and transportation of the material during that time has been fairly satisfactory. Any trouble arising from it has been traced mostly to the carelessness and negligence of collectors, in whose ranks it seems to be necessary to make changes now and then.

From the commencement of the full operation of this plant in September, 1892, to August 31, in 1893, one year, the company has collected and transported to the plant and disposed of 15,000 tons of garbage, averaging a little over forty-eight tons per day, counting twenty-six days in a month; 15,943 small dead animals, and 660 dead horses.

The relief to a city the size of Milwaukee in having this vast amount of refuse disposed of, can better be understood by sanitarians than by any one else, and comment thereon is unnecessary before this assembly.

There is one very important feature, from a sanitary standpoint, in connection with the disposition of this material, and that is, that a process which utilizes the materials, or converts it into merchantable products, encourages the managers to collect all of the garbage they can find, for the more they get the more profit there is in their business. And the economic point of any process which can save and not destroy is self-evident to any one who gives the matter any thought.

The cost to the citizens in collecting, transporting and disposing of this material seems at first sight to be large, but when one learns by figures that the cost of having this material promptly removed, taken out of the city and disposed of in a sanitary way is only a trifle over twenty-six cents *per capita* per annum, any charge against heavy expense in accomplishing this result would, I am sure, in the mind of any sanitarian, drop into insignificance.

Ptomaine Poisoning.¹

BY J. C. GILBERTSON, M.D.



ANY of the common ailments or diseases that the human race is heir to are now universally conceded to be caused by living organisms. Bacteria or microbes have been wandering upon the face of the earth for nearly 6000 years, seeking whom they may devour. So deadly and so appalling has at times been their work that humanity has time and again cried to heaven for deliverance. Yet so successfully have these germs labored in disguise that it is only in the latter part of this nineteenth century that they have at all been discovered. The scientist and microscopist, the chemist and bacteriologist of the last ten or twenty years have somewhat succeeded in piercing the curtain and viewing a few of the hitherto unknown actors.

Bacteria are the lowest forms of vegetable life. They are minute, unicellular in structure, and multiply by division and the formation of spores. They split up complex substances into simple elements through the process of putrefaction. Most bacteria are harmless, but some after gaining admission to the body are capable of producing disease, and are known as pathogenic.

Recognizing the fact that germs do bear a causal relation to some diseases, the question arises, how do these organisms produce disease? Several theories have been advanced:

- (1) The germs deprive the blood of oxygen.
- (2) The bacilli accumulate and form mechanical obstructions in the vital organs.
- (3) The bacilli consume the protoids of the body.

All of these theories have been shown to be defective, and none are at the present satisfactory. Hence a fourth and generally accepted theory:

- (4) Bacteria during their growth elaborate a chemical poison, which is soluble, and which when introduced into the circulation produces fever and the characteristic symptoms. The chemical poison is known as ptomaine. We will then define a ptomaine as

¹ From Rhode Island Medical Science Monthly.

product of bacterial decomposition. Vaughan gives an explanatory definition, and defines a ptomaine as a "chemical compound which is basic in character, and which is formed by the action of bacteria on organic matter."

A large number of the ptomaines are inert, others highly poisonous. We will consider the latter only.

This bacterial decomposition may take place in or outside the body. We will, therefore, consider ptomaine poisoning in relation to the body from external and internal causes.

I. EXTERNAL CAUSES.

Whenever bacteria have under favorable conditions attacked matter outside of the body, and by decomposition have elaborated their characteristic poisoning, and this again has gained admission to the body, generally through the alimentary tract in food or drink. Under this head is poisoning from ham, sausage, oysters, mussels, milk, cream, cheese, etc. We will not discuss each in detail. The ptomaine gaining admission is already in a soluble state, is quickly absorbed, and symptoms usually develop early. There is much similarity in symptoms, and they may be grouped under the following divisions:

(1) A true gastro-intestinal irritation, in which we have vomiting, purging, cold, clammy skin, anxious countenance and much depression.

(2) Purely nervous, sensation of heat, itching, nettle-rash eruptions, swelling, asthmatic breathing, etc.

(3) A kind of intoxication, in which we find dizziness, muscular weakness, muscular spasm, paralysis, coma, and death.

Treatment.—Preventive and symptomatic.

II. INTERNAL CAUSES.

Most of the infectious diseases, suppuration, puerperal fever etc., are conceded, and many proven, to be due to pathogenic bacteria. We will consider a few:

Diphtheria.—Says Vaughan: "That the Löffler bacillus is a cause of diphtheria no one can now deny. The fact that this germ, although found only at the seat of inoculation, causes marked systematic disturbances, indicates that its action must be due to its soluble products." The bacillus gaining admission in the body, and finding lodgment in its favorite location about the

tonsils, in the pharynx, larynx or nares, acts as a local irritant producing an exudative inflammation. In so doing it first induces death of the cells with which it comes into contact, particularly the superficial epithelium and the leucocytes. The further action of this necrosed tissue, and of the bacilli, results in the elaboration of a ptomaine which is soluble, becomes absorbed into the circulation, and produces the marked systemic infection. From this point of view we consider diphtheria as primarily a local disease, and the constitutional disturbances as due to poisoning by the ptomaine of the diphtheric bacillus.

Typhoid Fever.—Most of the bacteriologists and the profession at large believe that the bacillus of Eberth is the specific cause of typhoid fever. To this belief Vaughan and a few others take exception. At present, however, I am willing to recognize Eberth's bacillus as a cause of typhoid fever. This bacillus, if it succeeds in passing the stomach without being destroyed by the gastric juice, seems to have a special affinity for Peyer's patches of the small intestines. Here it acts as a local irritant, causing hyperemia, death of cells and necrosis, and in so doing elaborates its characteristic poison, by some termed the "typho-toxine," which is largely responsible for the marked constitutional symptoms.

Tetanus.—The bacillus of tetanus is primarily a native of the soil, but is frequently found on rusty nails, fork-tines, splinters, etc. The bacilli, I believe, have never been found in the blood of tissues beyond the point of introduction. Their action is entirely local. Here they multiply and elaborate their ptomaines, which have a special action on the spinal cord and spinal centres.

To bring to a close, I am inclined to the following deductions:

(1) Pathogenic bacteria cause disease by the elaboration of ptomaines.

The primary action of pathogenic bacteria is local, and the constitutional disturbance is brought about by the absorption and action of ptomaines.

How, then, are we to meet and counteract these conditions? Bacteria, being living organisms, are made inert or destroyed by antiseptics and germicides. Ptomaines, being chemical productions, remain uninfluenced thereby.

Our first effort then becomes to destroy the bacilli, and as far

as possible to prevent the elaboration of ptomaines. This is best accomplished by early, thorough and continuous local antiseptic treatment.

Our second effort is to counteract the depression and marked constitutional disturbance caused by the absorption of the chemical productions. This is best accomplished by supportives, stimulants and remedies to counteract the prominent symptoms as they arise.

Scavenger Work.¹



It will be conceded without controversy that one of the first requirements for municipal health is the prompt removal of household refuse.

In towns provided with sewers, means are afforded for carrying off liquid wastes, such as kitchen slops, laundry and bath waste water ; but solid refuse, such as apple and potato parings, watermelon rinds, corn husks, scraps from the table, etc., must be disposed of in some other manner. Doubtless one of the best ways is for such matter to be burned in the kitchen fire, and most of it can be gotten rid of in that manner. But a large number of families use natural gas or gasoline stoves, especially in hot weather, when such refuse accumulates in greatest amount and is most subject to decomposition.

But few of our towns have any system for the collection and removal of garbage. In small villages the common practice is to throw refuse matter into the alleys behind dwellings and business houses. Perhaps once or twice during the summer the garbage is removed from the alleys. In many of the larger towns and in some villages, throwing garbage into the alleys is forbidden, and the house-holder will then usually deposit it in the ash-pile. With careless people it will be allowed to remain until a nuisance is created, and the board of health orders its removal.

To avoid the evils arising from disposal of garbage on the premises, many municipalities provide by ordinance or by laws of the Board of Health that property owners shall keep a tight receptacle for garbage, and have it removed once a week or oftener in

¹ From the Monthly Sanitary Record.

hot weather. No provision is made for any one to remove it, except, perhaps, to license certain persons to do such work, dependence being placed on the law of supply and demand. As it is seldom the houses are visited until complaints by neighbors are made, this plan offers but little improvement over the disposal by the individual on his premises. Other reasons why this is so, are—first, because even the well inclined are often unable to secure a scavenger, especially if living at a distance from where the garbage is to be dumped; second, the garbage is removed in a dirty, slovenly manner, leaving a foul, evil-smelling receptacle on the premises; third, no public dumping-ground, as a rule, is provided for garbage, and it is dumped here and there about the outskirts of town, and makes constant trouble and annoyance.

In a few places the removal of garbage has been let to contractors, the garbage to be removed either at the expense of the individual property owner, or at the general expense. This plan is generally a failure. The work is nearly always slighted; garbage is not promptly removed, and there is constant warfare between the board of health and the contractor.

The best plan is for the town to do the work itself. It should provide—first, that only tight-covered, easily-cleaned receptacles of approved pattern shall be used. These could be sold to property holders at cost. By thus purchasing in quantities there would be quite a reduction to individuals, and easy handling of the garbage would be guaranteed. Properly there should be two garbage pails for each household (they may be made in different sizes to suit large or small families), and the owner, if he chooses, could have his name painted on them so as to insure the return of his own pails.

The city should also have its own garbage wagons, teams and employees, all under the management of the board of health. Works for the disposal or destruction of the garbage, or a dumping-ground, should also belong to the city. Here there should be an abundance of hot water provided for cleaning the garbage pails. The city should be so divided into districts that one team could visit every household in a district twice a week or oftener, during the hot months, and as often as found necessary during the winter. The wagon would start out loaded with clean, empty pails which would be substituted for the full pails found upon the premises. When a load of full pails had been collected they would be taken to the dumping place or disposal works, emptied and left for

cleaning; a load of clean, empty pails being taken from the dumping grounds for the next trip. With system and management, it would be possible, if desirable, for each property owner to always receive his own individual pails; and the trip of the garbage wagon could be so arranged that it would call on a certain list of houses, on a certain day, or days, of each week, so that householders would always know when to look for it.

This system would guarantee the complete and proper removal of garbage, and the expense would be mainly borne by those best able to afford it. As the proper removal of garbage concerns the health and comfort of all the people, there is much reason for this work to be done by the city as there is for the cleaning of streets. We hope yet to see this practiced in all cities.

The Human Figure.

The proportions of the human figure are strictly mathematical. The whole figure is six times the length of the foot. Whether the form be slender or plump, the rule holds good, any deviation from it is a departure from the highest beauty of proportion. The Greeks made all their statues according to this rule. The face, from the highest part of the forehead, where the hair begins, to the chin, is one-tenth of the whole stature. The hand, from the wrist to the tip of the middle finger, is the same. From the top of the chest to the highest point in the forehead is a seventh. If the length of the face, from the roots of the hair to the chin, be divided into three equal parts, the first division determines the place where the eyebrows meet, and the second the place of the nostrils. The height, from the feet to the top of the head, is the same as the distance from the extremity of the fingers when the arms are extended.

Origin of Hot-water Drinking.

The famous Dr. Sangrado, of whom the original was Dr. Philip Hecquet, who was born in the latter part of the seventeenth century, seems to have been the originator of hot-water drinking. Dr. Hacquet was a great advocate of bleeding and copious hot-water drinking. He was also rigidly abstinent. For the last thirty years of his life he neither ate meat nor drank wine.

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A Proposed Sanitary Convention.

THE last legislature of Pennsylvania passed an act providing for the establishment of a local board of health in every borough in the State, over 600 in number. With the view of securing uniformity of action, the State Board of Health, at its last meeting, decided to hold a Sanitary Convention in Harrisburg during the month of January, 1894, the special feature of which shall be an assemblage of representatives from these local boards. The Editor of this journal was appointed chairman of a special committee to make arrangements for this convention. The funds at the disposal of the State Board of Health are so limited that it will be impossible for the board to meet all the expenses of this convention, which will probably amount to about \$500; hence the chairman would be glad to receive donations towards this fund from any of our readers who may feel an interest in the subject. Contributions for this purpose may be sent to the chairman of the committee, Dr. Joseph F. Edwards, 1532 Pine Street, Philadelphia, Pa.

ACCORDING to Corvisart, the normal pulse rate of Napoleon Bonaparte was under forty beats in the minute.

"IGNORANCE of the laws of health has conscripted more people for the grave than all the battle fields of the world."



The Perfect Female Form.

Nothing is more truly artistic than the simply-outlined oval of the perfect female form, writes May Root Kern in the *Ladies' Home Journal*. It is but slightly depressed at the waist, the hips are as wide as the shoulders, there is not an angle from top to toe. It is as different from the outline of the fashionable "well set-up" woman, with her squared shoulders and angular hips, as a horse is from a camel. We call the high-belted Empire dresses artistic, because they preserve this oval better than the long-waisted shapes. The nude figure has no belt line. When the weight rests equally upon the feet, and the body is held upright, the smallest measurement of the waist is about where the modern belt is placed. But let the body bend to one side, and the point of intersection of the hip and side muscles will be over an inch above the former belt line. This is why field laborers, even to the slenderest young girls, are "short-waisted." For hygienic reasons the belt should never be placed below this point, and by thus shortening the straight under-arm seam an inch, the beauty of the uncorseted waist is materially aided.

Measurements of a Swimming Girl.

M. de Berselli is at work on a statue of "The Diving Girl," and as a model he has chosen Miss Clara Beckwith, the champion lady swimmer of the world.

"I do not think there is a more perfectly formed woman in America than Miss Beckwith," said he. "Miss Beckwith's measurements are perfect, and besides she has development of muscle, with no superfluous flesh. Her head in length measures $9\frac{1}{2}$ inches, so does her foot; her chest measures 39 inches, and she can easily expand it three inches more; her hip measures 40 inches, upper arm $12\frac{1}{2}$ inches, and her lower arm $10\frac{3}{8}$ inches. The measurement of the neck should equal that of the calf, but my model's neck is $13\frac{1}{2}$ inches, whereas the measurement of the calf is $14\frac{1}{2}$ inches. My work will not be original, because it will be a reproduction of the well-known picture of the diving girl, with hands raised above the head, and just about to make the leap. My model will, however, enable me to add new grace and beauty to the subject."

The Marvelous Bacteria.

The reproductive power of many species of bacteria is so marvelous as to be entirely beyond belief. Professor Lau says that he has experimented with several different forms of these minute organisms that were capable of doubling their number every hour.

When in good condition an average specimen of bacterium will produce 16,777,200 individuals of his kind in the short space of twenty-four hours. In forty-eight hours the offspring from a "germ" measuring not more than one-fifteen-thousandth of an inch, will have increased until the bulk cannot be put into a half-pint measure, the total number of individuals then exceeding 281,500,000,000. If these deductions are correct (and scientists of ability have proven that they are as near as such figures can possibly be approximated from the very nature of the experiment), is it any wonder that "germ" or bacterial diseases are so difficult to control?

Dr. Adametz, the Swiss savant, says that there may be more living, breathing creatures in a pound of cheese than there are inhabitants on the globe.

A National Board of Health—How It Might be Composed.

Concerning the construction of the National Board proposed there is a difference of opinion only as to details. All authorities agree that it should be composed of trained sanitarians who should be appointed by the President, should have a chief, and should include in their number the surgeon-generals of the marine hospital service, the army and the navy.

One excellent suggestion, offered by an eminent and experienced sanitarian of New York City, is that the board be made up as follows:

First, a chief appointed by the President, who should be paid a large salary and should reside in Washington; next, the three surgeon-generals of the army, navy and marine-hospital service; then, one sanitarian of established reputation from each of the following sections of the country; the yellow fever district of Louisiana; the quarantine district of the east; the far west of

California and the Pacific coast ; the northwest—say Chicago—because of its relationship to Canada ; and the middle district of the country—say Kentucky or a neighboring State. Each of these also should receive a good salary. This would make a board of nine members ; who would represent the interests of the whole country, and would give all sections the benefit of their combined sanitary knowledge and experience. This board should be given full legislative, judicial and executive powers, such as are exercised by the Board of Health of New York City. It should devise measures, decide upon the method of their execution, and administer them without interference from any quarter. It might constitute as its executive committee the chief and the three surgeon-generals, who should be made the administrative force of the bureau. This would put the duty of executing the rules and regulations of the bureau into the hands of the only officials we have in this country who are especially fitted for the work ; that is, officials who are permanent, who have no private interests, who are removed absolutely from all outside influence of any kind, political or other, who are trained in the work of discipline and organization, and who are accustomed to look to no other end than efficient service. The executive committee and the chief could really conduct the department, the other members of the board coming together on summons whenever their presence was necessary.

The plan seems to us well considered, though of course it is possible to improve upon it. The main thing is to get the National Board and to have it begin at the earliest possible moment the work which Dr. Prudden outlines as its sphere of usefulness. Of course the establishment of a National Board must be accompanied by the abolition of all State and local quarantines, but not of the State and local boards of health. No political influence should be permitted to delay one moment the work of such a reform. It goes without saying that the question of the health and well-being of the whole country is of too great importance to allow the selfish greed of politicians or of political organizations to stand in its way. That any set of politicians should oppose such a necessary measure is an illustration of the spoils system which ought to startle the community.

Volunteer Citizens' Association.

Over and over again has attention been called by the *Bulletin* to the advantages to be derived from sanitary associations, which should steadily and regularly keep a lookout upon reform and improvements in their respective localities. Our position has been proved by the admirable work now for years past accomplished in New Orleans under the Citizens' Auxiliary Sanitary Association, and more recently in New York City by the Ladies' Association.

In England, it seems that a much wider range is taken by volunteer citizens under the name of Ratepayers' Protection Associations—we would say 'Taxpayers' Associations. It is now admitted that there are in England no more useful institutions than these. They watch over the work and expenses of official bodies, and at election times bring to bear upon the polls a powerful influence for the general good of wards and districts irrespective of politics.

Recent writers speak with wondering praise of the great improvements, at economical cost, made in Bradford, Birmingham, and other cities through this instrumentality.

In America we make a vast expenditure of time and money putting into office our city and county rulers (servants) and then go to sleep. Yet these are the very men upon whom we are most dependent for sanitary care, for police protection, for good thoroughfares, and in short for all the comforts of communal life. This sleepy negligence should be changed. Our people ought to take the perpetual interest in material and daily affairs that they show in spiritual and invisible realities. The churches are magnificent examples of what can be done by voluntary organized effort. They are the people's universities; the upholders of sentiment and morality; the crowning glory of the American masses. Truly the salt of the earth, whatever flippant ignorance may contend contrariwise.

One-tenth of the disinterested public spirit so wonderfully and profitably exhibited through our churches given to concerted action in behalf of good city and county government would soon place us high among nations as exemplars of true local or home rule.—*Tennessee State Board of Health Bulletin.*

Limit of the Periods of Incubation and Contagion in Infectious Maladies.

The Clinical Society of London has recently conducted an inquiry for the purpose of determining more exactly the incubation periods of various infectious maladies and the length of time danger from infection lasts. The results of this inquiry are summarized as follows by *Medicine Moderne* :

Diphtheria.—The average incubation period is two days, more rarely four days, and occasionally seven days. The virulence of contagion is very great. Infection may occur at any period of the disease, and the disease may be communicated by contaminated clothing or any other objects for several months after exposure.

Measles.—The incubation period of this disease varies from four to sixteen days. The danger of contagion exists during the whole course of the disease, but disappears very rapidly after convalescence. Danger of transmission of the disease through the clothing probably exists only a short time after contagion.

Scarlet Fever.—The incubation period is very short, rarely reaching six days. The contagious elements persist a long time after recovery, lasting three months at least.

Rötheln (Rubella).—The incubation period of this disease is very variable, the average is about eighteen days. The contagion is most active just before the appearance of the eruption and during its development. The contagious period continues for a short time after the eruption is fully developed.

Mumps.—The incubation period is the same as that for rötheln. Contagion is greatest during the first three or four days.

Small-pox.—The average incubation period is twelve days; the minimum, nine days; the maximum, fifteen days. Contagion may occur at any period of the disease. Infection may occur through personal contact or through the clothing.

Chicken-pox.—The incubation period is fourteen to twenty days. It is less contagious than small-pox, and is greatest during the period of eruption.

Typhoid Fever.—The average period of incubation is twelve or fourteen days; sometimes nine days; occasionally twenty-four days. Contagion may occur at any period of the disease, and even during two weeks after recovery. The contagious elements in the discharges or the clothing remain active for at least two months.—*Good Health*.



**Twenty-first Annual Meeting of the American Public
Health Association in Conjunction with
the International Congress of
Public Health.¹**

OCTOBER 10.—FIRST DAY.—MORNING SESSION.

The Congress convened in Hall Seven of the Memorial Art Palace, and was called to order by the President of the World's Congress Auxiliary, the Hon. Charles C. Bonney, of Chicago, at 10.30 A.M.

Prayer was offered by the Rev. Dr. Parsons, after which addresses were delivered by Hon. C. C. Bonney, Mrs. Charles Henrotin, Dr. A. R. Reynolds, Commissioner of Health of Chicago, representing the mayor, Dr. E. Liceaga, of Mexico, and Dr. Sarah H. Stevenson, of Chicago.

Mr. Bonney then introduced Dr. S. H. Durgin, of Boston, President of the American Public Health Association, as President of the Congress, who replied to the several addresses, after which he delivered his Inaugural Address.

Dr. Durgin briefly said that the great trust which the Association took upon itself twenty-one years ago has been worthily held, and the work to which it has addressed itself in the interest of humanity, has been diligently pursued. It is fitting, perhaps, at this time, when we may be said to have attained our majority in years, to take a retrospective glance of public sanitation, and to note the possible results of its application in the relief of human distress. The work of the sanitarian is manifold, and deals with the most vital of our personal and social interests. It deals with the air we breathe, the food we eat, the water we drink, and with the general welfare of mankind. It means the investigation of the rise, progress and decline of epidemics, and a fostering growth of works and projects designed to prevent and remove the cause of disease.

The sanitarian concerns himself but little with the cure of disease. The problem which he seeks to solve is how disease can be averted. The pathologist establishes the nature of morbid processes, and his investigations suggests to us the appropriate remedy. The aim of the sanitarian is to seek out and remove the cause or causes which produced these processes. It has been said that preventive medicine embraces everything which relates to the physical well-being of our fellowmen, so that it has to deal with all physical evils, and, incidentally, many of a moral character. Its object is the health, and therefore the happiness and prosperity, of man.

In Mexico it has been shown that sanitary science must have reached a high degree of perfection in its history. Previous to the conquest of the coun-

¹ Abstract of the Proceedings of the Joint Sessions of the Congress, held in Chicago, Illinois, October 10, 11, 12, 13 and 14, 1893.

try by the Spaniards, the towns were thoroughly and efficiently supplied with water by the most perfect system; but the teachings of these early times were not permanently effective. The magnificent civil works were doomed to suffer ruin, and the world passed through dark ages of mental and physical barbarism.

The question of private or house drainage is more complex, and should be constructed only under regulations prepared by competent sanitary engineers, by plumbers who have shown their competency for such work to a proper board of examiners, and have been licensed therefor. The material for this work should be strong, tightly jointed, securely trapped and ventilated above the top of the house.

In the city of Boston our private drainage, like that in most cities, is unsatisfactory, and the cause of an immense amount of inspection, complaint and annoyance, and undoubtedly the cause of much ill health. We have statute laws and city ordinances which specify the method, material and workmanship necessary for the construction of house drainage. Plans for construction and repairs are submitted to, and the work approved by, the inspector of buildings.

The board of health is called upon to find defects and to order repairs, and such repairs each year number about 4500.

For the purpose of ascertaining to what extent defective conditions of plumbing exist, and to what extent traps are supplied, and water closets substituted for privy vaults, we have taken a large number of blocks of dwellings, both new and old, each season for thirteen years, and made house-to-house inspection.

The construction and care of our public and private streets have a sanitary side to be considered, especially when we remember the considerable proportion of the area of our cities which they occupy, and the frequent unsanitary condition in which we find them. While the construction of streets is almost purely a matter for the engineer, the health officer has frequent cause to complain of their filthy condition. Most streets in all cities present a more or less unclean and offensive surface. This condition may be due to a faulty pavement, want of pavement, or a lack of care, supported by the popular notion that an unclean and muddy condition of the streets has no appreciable effect upon the public health. Macadamized streets, where much used, are unclean and offensive most of the time.

It is a common thing to find on death certificates, instead of the morbid process which caused death, such indefinite information as "disease of bowels," "disease of brain," "disease of skin," "stomach disease," "ascites," "convulsions," "dropsy," "fever," "debility," "teething," "inflammation," "infantile," "heart failure," and other unlikely causes too numerous to mention, and which ought never to be used upon the record as causes of death.

In my own city such certificates are rejected, and a competent physician sent to view the remains, and consult the family or friends of the deceased for information, with which to make a proper certificate.

It is to be noted, however, that information gathered in this way cannot be regarded as wholly trustworthy and often results in the statement "unknown cause of death."

The mention of cholera, like that of small-pox, strikes terror to the people of this country, and while the deaths from these diseases are infinitely small, the fear of them have served the municipal health officers in securing almost unlimited facilities for their prevention and control, which means may be largely converted to the care of other more common and destructive contagious diseases.

Consumption, the most destructive malady to the human race in our country, has received the necessary attention of the bacteriologist. He has demonstrated to us satisfactorily the cause of the disease, the methods of its transmission, and the means for its prevention.

He is sorry to say that as practical workers in public sanitation we have sadly neglected to apply the means which we believe would prove effectual in largely abating the prevalence of tuberculosis.

The isolation of all persons suffering from consumption, would be impracticable and perhaps unnecessary, but the use of small sputa cups containing a disinfectant, at home, and bits of absorbent napkin used and securely concealed in traveling, to be burned or otherwise disinfected on returning, should at least be urged by public health officers, and popularized as much as possible.

Earth worms, it was urged, bring to the surface bacilli which infect the dead body, and in dry weather they may be inhaled in the form of dust. This, it is suggested, is the reason why the health resorts of the south of Europe are centres of tubercular contagion.

Drs. Lortet and Depugues, of Lyons, related cases of such infection, and described experiments which they made which led them to demand obligatory cremation. They mixed the sputa of consumptives with earth, which they placed in pots. A month later the worms in them were tubercular, and the earth they passed through communicated the disease to animals.

Tenement and lodging houses are subjects for the constant watchfulness of the health officer, and they are too frequently found in an overcrowded and filthy condition. They are principally occupied by the poorest classes of people, including the newly-arrived emigrant, whose habits of cleanliness are of the lowest order.

Turning, in conclusion, from the more onerous every-day duties of the municipal health officer to topics of greater popular interest, we find an increasing growth of public sentiment in all parts of the country favoring the municipal provision of large public parks, free public baths, small open spaces and open-air gymnasiums for the enjoyment and sanitary welfare of the masses of people whose whole time is spent in the toil of our large towns and cities.

The General Committees of the World's Congress Auxiliary on a Public Health Congress, consisted of Drs. John H. Rauch, chairman; F. W. Reilly, vice-chairman; F. W. Brewer, and C. N. Hewitt, joint secretaries; E. Garrott, J. M. Hall, John B. Hamilton, Liston H. Montgomery, S. J. Jones, A. R. Reynolds, and B. J. D. Irwin.

After some announcements by Dr. Brewer, the Congress adjourned until Wednesday morning.

OCTOBER 11. —SECOND DAY.—MORNING SESSION.

The Congress was called to order at 10 A.M. by the President.

The first paper read was by Dr. Albert H. Gilon, Medical Director of the United States Navy, entitled *Sanitary and Medical Service on Emigrant Ships*.

Report of the Committee on Restrictions and Prevention of Tuberculosis.—This report was read by the chairman of the committee, Dr. J. N. McCormack, of Bowling Green, Kentucky. The committee offered as its report the following conclusions and recommendations:

(1) Tuberculosis has been conclusively demonstrated to be contagious, by bacteriological experiments, by clinical observations and by a study of the history of the disease.

(2) Tuberculosis is a preventable disease. Its preventability follows as a logical sequence upon its contagiousness, but has likewise been demonstrated in practical life.

(3) The contagium of tuberculosis resides entirely and solely in broken-down tubercular tissue. A person suffering from tuberculosis, therefore, does not become a source of danger to others until he begins to give off broken-down tubercular tissue, either in the form of sputa from the throat or lungs, diarrhoeal discharges from the bowels, or matter from a tuberculous sore, such as lupus, white swelling, cold abscess, scrofula or tubercular inflammation of a joint.

(4) A person suffering from tuberculosis can be made entirely harmless to those about him by thorough sterilization of all broken-down tissue immediately upon its being given off. With proper precautions it is, therefore, possible to live in the closest relation and upon the most intimate terms with consumptives without contracting the disease.

(5) Tuberculosis is not hereditary. A predisposition to the disease can be transmitted from parent to offspring, but this is more true of tuberculosis than it is of all other contagious diseases.

(6) A predisposition to tuberculosis can be created anew by malnutrition or by anything that depresses the nervous system.

(7) Tuberculosis affects animals as well as man, and is identically the same disease in both. In domestic life human beings and animals mutually infect each other.

(8) The media through which human beings are ordinarily infected by animals are milk and meat.

(9) Houses in which consumptives have lived, and in which immediate sterilization of broken-down tissue has not been practiced, are infected houses, are liable to convey the disease to subsequent occupants.

(10) Spitting upon floors and into handkerchiefs and permitting the broken-down tissue to dry and become pulverized is a prolific cause of spreading tuberculosis.

(11) Temporary occupation of hotel rooms, sleeping-car berths and steamer cabins by consumptives in the infectious stage can infect them so as to convey the disease to subsequent occupants unless proper precautions are taken against contamination of the bedding, furniture and walls with broken-down tubercular tissue.

We recommend the following practical measures for the prevention of the disease ;

(1) The notification and registration by health authorities of all cases of tuberculosis which have arrived at the infectious stage.

(2) The thorough disinfection of all houses in which tuberculosis has occurred, and the recording of such action in an open record.

(3) The establishment of special hospitals for the prevention of tuberculosis.

(4) The organization of societies for the prevention of tuberculosis.

(5) Government inspection of dairies and slaughter-houses, and the extermination of tuberculosis among dairy cattle.

(6) Appropriate legislation against spitting into places where the sputum is liable to infect others, and against the sale or donation of objects which have been in use by consumptives unless they have been thoroughly disinfected.

(7) Compulsory disinfection of hotel rooms, sleeping-car berths and steamer cabins which have been occupied by consumptives, before other persons are allowed to occupy them.

The reports and recommendations of the committee were adopted.

Tropical Diarrhœa.—This paper was contributed by Sir Joseph Fayrer, of London, England, and read by Dr. Gihon.

This is a form of disease which is generally, if not always, the result of tropical and climatic influences, and the debility and cachexia induced thereby. It is now not infrequently observed in Europe, owing to the ever-increasing means of communication with foreign countries. It is apparently generally confined to adults, is insidious in its onset, slow in progress, and often, when not arrested sufficiently soon, fatal, owing to irreparable degenerative changes.

It has been described by many observers both English and foreign, in India, China and Cochin China, and Batavia. Most of the cases seen in this country come from China, India or Ceylon. In India it is met with frequently, where a form of it is known as "hill diarrhœa," from its proneness to affect dwellers in hill stations, especially those who have previously lived in the plains, atmospheric changes, vicissitudes of temperature, greater altitude, rarified atmosphere and possibly water being concerned in its causation. Some authors consider it a distinct disease from the white flux, which may be seen in any part of the country, but they are so much alike as to justify the belief in their identity, at all events for practical purposes. Occasionally there is a resemblance to certain forms of chronic dysentery ; the two conditions may be associated or one may merge into the other.

Tropical diarrhœa occasionally makes its appearance years after the subject of it has returned from the tropics. It not infrequently begins without any previous apparent derangement of health, though it is sometimes preceded by dysentery, diarrhœa, some indication of malarial infection or functional derangement of the liver or other abdominal viscera, and is not noticed until excessive soreness of the tongue and loss of strength and wasting reveal the gravity of the condition.

Semiology.—This form of diarrhœa may begin with simple looseness of the bowels, or may supervene an ordinary diarrhœa or chronic dysentery.

The action produces a sense of relief. The dejecta at first may be natural and bilious, but gradually become light-colored, frothy, pultaceous and copious. As the disease advances they are occasionally tinged with blood, and the sufferer becomes more attenuated, exhausted and incapable of any prolonged exertion. The appetite may be good, but rawness and tenderness of the mouth and tongue frequently accompanied by aphthous spots and ulcerations interfere with its gratification.

Treatment.—From the insidious character of the disease, tropical diarrhoea not infrequently gains ground before radical measures for its relief are resorted to. Successful issue depends much on the patient's resolution and perseverance in carrying out instructions. Alternations of temperature, errors of diet, fatigue or excitement, exertion, mental or physical, should be avoided. Physiological rest should be insisted on.

There is a tendency in the earlier stages to get well. The object is to favor this tendency and not thwart it by neglect of precautions. Diet is the most important consideration and must be strictly regulated and adhered to; and scarcely less important is the question of clothing, habits and mode of life.

Milk *alone* should be the only diet, and it must be given in small quantities often repeated, say from four to six ounces every hour, day and night. Larger quantities at longer intervals will not do. When in the twenty-four hours an adult is able to take three to four quarts of cow's milk in this way, ample nourishment is afforded to support his strength and to enable him to recover.

This method of treatment was begun by the author before leaving India in 1872. After prolonged experience and trial of all other forms of remedies, he has found it more effective than anything. It seldom fails except in the very advanced and chronic cases, or in very aged persons. The conclusion arrived at is that though drugs are generally of little avail, if milk, taken as prescribed, does not succeed, there is but small chance that any other form of treatment will do so.

Cholera Infantum and Its Treatment.—By Dr. Manuel Septién, of Queretaro, Mexico.

The treatment proposed is exceedingly efficacious. It consists in the total suppression of all food and medicine during twenty-four or forty-eight hours, and the prescription of pure, cold water in great abundance. The author said there is scarcely any disease that causes a greater mortality in childhood than that known by the name of estival diarrhoea or infantile cholera. In one single week, the last one of July of the present year, there were 1126 deaths in thirty-three of the largest cities of England, caused by this disease alone. Statistics show everywhere a notable increase in the number of deaths during the months of June, July and August, that is to say, during the warmest season of the year. The malady is not limited to children only, but attacks also a great number of adults and old people, being less mortiferous in the latter than in the former, in whom it causes a mortality of 50, 60 and even 80 per cent. Only Asiatic cholera, to which it has the greatest similarity, can be compared to it for its ravages. It is undoubtedly of microbic origin as recent investigations have shown.

Energetic drainage is the supreme effort which nature executes to rid

the organism of the deleterious elements that poison it. To try to suppress it by therapeutical means is not an easy or rational thing to do. It would only hinder the natural curative process. The only thing that can be done is to oppose the extreme dehydration of the tissues by restoring to them without delay, at least, a part of the water lost. This is the therapeutical indication, and no drug can take its place, nothing but pure, cold water.

All the curative methods tried leave much to be desired. Their results are very precarious, all consist in the administration of various medicinal substances, now astringents, absorbents, antiseptics or antiperistaltics, and in the prescription of some alimental regimen. Such treatments, according to the author, are not in conformity with the great principle that governs therapeutics, namely, *the rest of the organ that suffers*.

The author had practiced successfully the treatment recommended by Luton, of Rheims.

He summarized the points of his paper as follows: (1) To suppress all nourishment and medicines for one or two days; (2) to give at discretion pure, cold water; (3) to return by degrees to a rational regimen.

Origin and Dissemination of Typhoid Fever.—By Professor W. T. Sedgwick, of Boston. Professor Sedgwick's remarks on this subject were impromptu. He first dwelt upon the reorganization of the State Board of Health in Massachusetts in 1886, shortly after which an experiment station was established at Lawrence for the purpose of studying typhoid fever chemically and bacteriologically, looking to the purification of the water. In 1890 an epidemic of typhoid fever broke out upon the Merrimac River in the city of Lowell, and shortly afterward appeared at Lawrence, nine miles below. These epidemics afforded unusual opportunities for the investigation of the epidemiology of typhoid fever.

SECOND DAY—AFTERNOON SESSION.

Mr. Allen Hazen, of Lawrence, Mass., read a paper entitled *The Sewage Disposal Problem in American Cities*.

He said one of the striking features of the sanitary development of American cities is the very rapidly increasing number of places which for one reason or another are treating in some way their sewage. It is not so very many years since there was hardly a sewage purification plant in the United States, while at the present time there are some thirty municipalities in a dozen different States which give their sewage a more or less thorough treatment. Of these a number are in the far West, where the sewage has a commercial value for irrigation which has probably been considered quite as important as the sanitary advantages secured by the treatment, but the greater number are in the East where a dense population and increasing desire for cleanliness in the waters of streams and lakes, and particularly in water supplies, has brought to an issue problems which as yet have scarcely received the attention of the inhabitants of the less thoroughly settled States.

There are two sewage problems which are entirely different in their nature, although the same remedies may often be applied to both. There is first the pollution of the rivers and lakes to such an extent that they produce

a nuisance to the people who live upon their banks, and secondly, the pollution of water supplies by sewage. The first case is often that of a city upon the banks of a small river which becomes so reduced in volume in dry weather that the sewage may fairly be said to be the predominating element in its composition. Up to a certain point rivers are capable of taking sewage without causing a serious nuisance to the people who live upon their banks, so long as they do not drink from them, but when this quantity has passed, deposits are formed, decomposition sets in, and the stream is rendered foul in appearance and objectionable in its odor. The exact quantity of sewage which can be mixed with water without causing a nuisance varies with local conditions and can only be approximately estimated, but as long as the limit is not passed, and the bodies of water not used for drinking, the disposal of sewage by turning it into such water is entirely unobjectionable and by far the most satisfactory method possible.

Where the sewage of a town is entering the public water supply of a neighboring town, or worse yet, its own supply, the problem is entirely different. The removal of the organic matters of the sewage becomes of secondary consideration, although still an important matter, while the removal of these germs of disease, which would otherwise work such mischief among the consumers of water, becomes the one important point.

The author then dwelt upon the possibility of sewage treatment by chemical precipitation, which he said was the same the world over. Local conditions are only of secondary importance.

The experiments undertaken by the Massachusetts State Board of Health at the Lawrence Experiment Station some six years ago, indicated that the local indications in Massachusetts would allow the treatment of sewage upon land even with more favorable results both as to quantity of sewage treated, and quality of effluent obtained, than had been supposed to be the case from a study of European practice.

It is impossible by any combination of chemicals to secure the purification which approaches even remotely the result obtained by land treatment, but when the problem is simply to keep the water into which the sewage flows reasonably clean, the result with careful manipulation is quite satisfactory. When, however, the treated sewage finds its way into the source of the public water supply, the effluent produced by even the most complete chemical precipitation cannot be regarded as an entirely unobjectionable addition, and such water should be further treated by filtration before use.

The Collection and Disposition of Animal and Vegetable Waste in the City of Milwaukee.—By Dr. U. O. B. Wingate, Commissioner of Health of Milwaukee. As early as 1879 the city of Milwaukee began to grapple with the garbage problem, and it has been a long and serious struggle until a recent date. In the winter of 1891 and 1892, the State Legislature passed an act authorizing the Common Council of the city to enter into a contract for the disposition of garbage, with the advice of the mayor and the commissioner of health. It was decided to let the contract for five years to a company who would build a plant fourteen miles out of the city, collect and remove to said plant all garbage, offal, dead animals, both great and small, and animal matter of the city of Milwaukee, including refuse matter from commission houses, etc., to said plant in which they would dispose of it in a

sanitary manner. This contract went into effect and the work was commenced in June, 1892.

The company constructed a plant at an expense of some \$110,000. They purchased a powerful steam barge for transportation; they put on fifty steel, air-tight wagon tanks for collection, and two large covered wagons for the collection of large dead animals. Since September 1, 1892, the plant has been in operation to the satisfaction of the city officials of Milwaukee, creating no nuisance or stench whatever, that can be reasonably objected to in its location, and the collection and transportation of the material during that time has been fairly satisfactory.

Disposal of Garbage and Waste of World's Columbian Exposition.—By Colonel W. F. Morse, of New York. Since the meeting of the American Public Health Association, two years since, marked progress has been made in the destruction of garbage and waste of cities by fire. Six years' experience has shown this method to be of far greater value than any other, and improvements in furnaces and reduction in cost of operation have steadily made it more popular and useful.

England has now furnaces in every large city and the number is yearly increasing. This country is awakening to the value of this method, and it has been inspected and recommended at a great number of places. The most striking and effective work done in the world is at the World's Fair, where two furnaces of the Engle Sanitary Company have been at work since the first of May.

It was early seen that the sanitation of the Fair, the care of the health of the great multitudes, resident and who would come as temporary guests, would demand the best methods of providing for the drainage, and the collection and disposal of the great mass of daily accumulating garbage and organic waste, and only those which had been thoroughly tested. After the drainage was arranged the question of sewerage disposal and garbage destruction came up. A contract was made with the Engle Sanitary Company, of Des Moines and New York, for two garbage cremators to burn 100 tons of sewerage sludge, garbage and stable refuse. These two furnaces were built in the fall, and at the opening of the Fair were ready for work. They are in the extreme southeastern part of the grounds, near the Forestry Building, back of the power house of the Intramural Railroad, employing the well-known device of the Engle Company, two fires, one at either end, the one burning the mass of garbage on the grates, the other destroying the smoke, gases and all results of this combustion. These furnaces have been in constant work every day since May 5.

The garbage is brought at night from 11 to 8 o'clock A.M., and placed at once in the furnaces—from twenty-five to forty loads, each of one ton, having sometimes ashes or water in large amounts mixed therewith. Everything goes into the furnaces; four horses, two camels, cows, deer, elk, pigs, goats, dogs, etc., all follow the same road and are burned with equal ease. No results can be seen from the chimney. A thin, invisible, carbonic acid gas, discharged at a temperature of 1000 degrees is all that results. No smoke, no odors, nothing that can be offensive is detected. Though in daily use an observer would not know any work was done unless he came to the building. At 10 A.M. the loads of sewerage cake begin to

come. This is a thick, heavy, soggy mass of lime, fœcal matter, paper pulp, etc., with 60 per cent. of water mixed. The quantity varies from ten to eighteen or twenty-five tons, and is the most refractory material to burn yet found. The fires are of oil, fed by jets of air, a pressure of twelve ounces of air doing the same work that is done in the boiler-house with 120 pounds of steam. The ashes are used by exposition people for filling low places, though they have a value of \$10 a ton for fertilizers.

There are six burners spraying oil, the whole using thirty-seven and one-half gallons per hour. The cost for fuel and labor is from 75 to 85 cents per ton for sewerage sludge and 50 to 75 cents for garbage.

At other places where these same furnaces are used the cost is reduced by bringing to the furnaces the paper, sweepings, and all kinds of city combustible waste, which makes fuel to burn wet matter and reduces the cost 12 to 15 cents per cubic yard or 30 to 40 cents per ton.

Official reports from Savannah were read showing the cost for last eight months to be 11 cents per cubic yard.

The work has been continuous, no stoppage, no nuisance, performed under observation of thousands of persons, inspected by many interested in this work from abroad, and has met with deserved credit and favor from the Board of Administration.

By adoption of similar furnaces at four points in Chicago the whole garbage nuisance could be abolished, the same work done for the city that is here performed, at a reduced cost, and the vexed problem of garbage disposal settled and got rid of once for all. This is no theory or experiment. This company was asked to do this work because they had demonstrated elsewhere their ability. There are forty furnaces or more built by the Engle Company in successful operation, more than twenty times as many as have been built by others, but this is the most successful instance of the destruction of garbage on a large scale that has been seen in this country.

How Can Women Promote Public Sanitation? By Dr. Sarah H. Brayton, of Evanston, Illinois. She said, as instructors in hygiene, nurses have a wider scope for sanitary reform than physicians. Living as they do with the families they attend, their opportunity for the diffusion of knowledge is greater. Undoubtedly there is much that women could do on health boards; there is more that they must do among their own sex to increase the sum of sanitary knowledge among all classes and promote intelligent co-operation with health authorities, whoever they may be.

The Progress of Sanitary Knowledge Among the Women of England. This was the title of a paper contributed by Lady Priestley, of England, and was read by Mrs. Henry Wade Rogers, of Evanston.

The author of the paper went back twenty years, when she first joined the Executive Committee of the National Health Society, and attended the meetings in a small, dingy, draughty room in a house about as unsanitary as any to be found in London, and traced the progress made in sanitary science from that time to the present. The author would impress upon all mothers and those who are responsible for the welfare of others, the desirability of giving personal care and forethought, which alone can avert the consequences of unsanitary surroundings.



This department is designed for the description of improved Sanitary Appliances and Medicinal Preparations introduced by patrons of The Annals. The matter is not paid for, nor can it be classed as advertising. But as the information is necessarily obtained from those who offer the appliances for sale, it is proper to say that the manufacturers, rather than ourselves, are responsible for the statements made.

A Successful Remedy in Treating Obesity.

FOR several years I have been on the lookout for some preparation which would reduce flesh without injuring the general health, but have never succeeded in finding one. Several weeks ago, however, I received a pamphlet on the action of phytoline (the active principle of the berries of *Phytolacca Decandra*) in obesity, and about that time a patient applied to me for a reduction in her weight. I prescribed phytoline, and directed her to take ten drops before and after the three daily meals. She has now taken about two weeks' treatment, and tells me to-day that she has lost fifteen pounds, and that, too, without making a change in her diet, or affecting her general health. I am pleased with the results, and conscientiously recommend it.—A. SANDFORD, M.D., Everett, Mass., in *Medical Brief*.

Platt's Chlorides the Best.

IN an extended article on "Disinfection and Sanitary Precautions," in a recent number of *The Doctor of Hygiene*, Dr. Cyrus Edson, Health Commissioner of the Board of Health, New York City, gives very good advice relative to the proper safeguards to be employed in order that good health may be maintained and epidemic or contagious diseases avoided.

Referring to the importance of thorough disinfection, and the employment of such chemicals as are best known, and to be relied upon as true germ-killers, and after stating how to prepare and employ different crude materials, he adds: "In case these mixtures cannot be made for any reason, as for example, the trouble and bother involved, Platt's Chlorides is the safest and best of the specially prepared disinfecting solutions now on the market."

It is gratifying to us, and undoubtedly to most of our readers, to feel that this well-known and so universally employed disinfectant is thus endorsed by one of such high authority and of such great experience in matters of domestic sanitation. Platt's Chlorides is a clean, nice and unobjectionable preparation; a liquid without odor or color, cheap, powerful and deservedly popular, always ready to do its work thoroughly and well.—*The Trained Nurse*, June, 1893.

A Family Laxative.

PHYSICIANS are not inclined to recommend self-medication to the laity. Yet there is one need which they are almost unable to supply. We refer to "the family laxative." The family physician is able to prescribe for the most complicated and obscure of maladies and yet is often puzzled to know just what to give when asked for a remedy which can be kept in the house for family use as a laxative, that shall be effective, free from danger, and not unpleasant to take. When absent on our summer vacation we were asked by four different parties, representing as many families, what we thought of the "Syrup of Figs." Not one word did we volunteer on the subject, and we were somewhat surprised to find that there was this small token of the very general use of that preparation. These parties said they derived more benefit from it, and found it more pleasant to take than anything of the kind they had ever used. The simple question with them was, is it a dangerous compound? We informed them that its active ingredient was a preparation of senna, and that it was entirely free from danger. With this assurance they volunteered the information that they should continue to keep it in the house.

The therapeutical properties of senna are so well known that comment on this seems unnecessary. It might be well to notice, however, that Bartholow says it is "a very safe and serviceable cathartic," and that it is "highly prized as a remedy for constipation." He also makes the important observation that its use "is not followed by intestinal torpor and constipation."

The simple truth of the matter is, we have altogether too few preparations which we can recommend to our families as effective laxatives. But the California Fig Syrup Company has one of the most desirable combinations for this purpose with which we are familiar. The Fig Syrup Company gives to the profession the composition of this preparation, therefore there is no secret about it; the persons who use this laxative speak in the highest terms about it; and we are pleased to notice that a large number of physicians are prescribing it.

Editor Annals of Hygiene:

In the November number of THE ANNALS OF HYGIENE, on pages 673-4, there appears a communication regarding one of my lectures, in which the writer has evidently not fully considered the import of my statements nor of those he makes concerning mine.

As there are several points involved in the question under discussion that I feel sure will be of interest to the general public, I would like to state that I have prepared a reply to the above communication, which I should be glad to have you publish at your earliest convenience.

Yours very sincerely,

SENECA EGBERT.

[Owing to lack of space, Dr. Egbert's article has been unavoidably crowded out of this issue. As it involves the important question of house-heating and ventilation, we shall be glad to present the discussion in full in the January number.]—ED.

